

Scientific Vision in Sri Guru Granth Sahib & Interfaith Dialogue



Hardev Singh Virk

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&
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Singh Brothers
Amritsar

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*Dedicated to the
Tricentennial Celebration
of the
Installation of
Sri Guru Granth Sahib
as the Sabad Guru of the Sikhs*

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Prologue

My interest in cosmology was kindled after reading a popular science book, *The Universe and Dr. Einstein* by Lincoln Barnett in my college days. During my post-graduation (M.Sc.) in Aligarh Muslim University, Aligarh (1961-63), my favourite subjects were Theory of Relativity and Physics of Elementary Particles. I also became interested in philosophy of science and metaphysics. I started my teaching career in Guru Nanak Engineering College, Ludhiana in 1963 but moved to Punjabi University, Patiala in 1965. My main concern was teaching 'Theory of Relativity' and Nuclear Physics to M.Sc. students and preparing text books of physics at B.Sc. level in Punjabi medium under medium switch over programme of the university.

During summer of 1967, I happened to attend a devotional music recital (*Kīrtan Samāgam*) of Gurbani by Sant Mohan Singh Brarewala in Singh Sabha Gurdwara at Patiala. I was privileged to have audience with Mohan Singh after the recital and enquired about the particular *sabdas* he chose for his discourse. To my surprise, it turned out to be Maru Solhe composition of Guru Nanak on the theme of Cosmology in *Sri Guru Granth Sahib* (SGGS). Fortunately, my mother was a deeply religious lady who introduced me to Gurbani at a very tender age and I accomplished the *Sahaj Pāṭh* of SGGS in my school days. I must admit that I was motivated by Sant Mohan Singh Brarewala to study Maru Solhe text with rapt attention to understand the implications of scientific vision of Sikh Gurus in SGGS. On my persuasion, a recital was organised on the university campus in November, 1967, where all the hymns pertaining to Sikh view of Cosmology were recited in a *kīrtan samāgam* at my residence.

The fifth centenary of Guru Nanak's birth was celebrated all over the world in 1969. Punjabi University Patiala and its affiliated colleges organised seminars during this year. Bibi Inderjit Kaur Sandhu, Principal GCW Patiala asked me to write an article for the special issue of college magazine in commemoration of Guru Nanak. The title of my article was "Cosmological Ideas in Science and Religion". Later on, its revised version was published in *Khoj Patrika* of Punjabi University, Patiala (1969) and *Journal of Sikh Studies*, Guru Nanak Dev University, Amritsar (1982). This paper has been read at some national and international conferences also.

Indian National Science Academy (INSA), New Delhi organised a Summer School on History of Science in September 1974. Professor D.S. Kothari, the renowned physicist of India and ex-chairman UGC, was chairman of the inaugural session in which I presented my paper "Cosmology in Science and Sikh Religion". Professor Kothari was very much impressed with the scientific vision in SGGGS and advised me to write a book to highlight the contribution of Sikh Gurus for the benefit of Indian people. The paper appeared in the Proceedings volume of INSA Summer School. Following Kothari's advice, a book of scientific essays based on Gurbani and Science titled *Brahmaṇḍ dī Rachnā* was published by Singh Brothers, Amritsar in July 1978. Prof. Harbans Singh of Sikh Encyclopaedia fame wrote an introduction, appreciating the unique contribution of the author in interpreting Gurbani and Science for the Sikh world.

During my scientific career of 40 years, my main concern was teaching and research in Physics. However, my interest in the study of Sikh religion was kept alive by my participation in national and international seminars organised by Guru Nanak Studies Department of Guru Nanak Dev University, Amritsar. After retirement in June 2002, Dr. Job Kozhamthadam, Director Indian Institute of Science and Religion (IISR), Pune offered me a fellowship to work on the project, "A Dialogue between Science and Spirituality with special reference to Sikh Religion". Father Job has been a great inspiration in this project. In fact, most of the essays included in this book were prepared during the tenure of my fellowship under IISR project.

During 2004, Interdisciplinary University of Paris invited me to compete for Global Perspectives on Science and Spirituality (GPSS) Award. My Academic Paper "Global Perspectives in Science and Sikh Religion" was recommended for Honourable Mention Award by the Jury. In July 2005, Pune University, Pune organised an International Conference in celebration of quatercentenary of compilation of *SGGS* with Dr. Surjit Kaur Chahal as the convener. My paper "Glimpses of Scientific Vision in *SGGS*" has been published as part of the proceedings. I thought this will be a suitable title for my forthcoming book of scientific essays. Gursagar Singh of Singh Brothers advised me to make it short and attractive as "Scientific Vision in *Sri Guru Granth Sahib*."

Ever since my student days in Aligarh for M.Sc. in Physics and later on as a research scholar in University of Paris leading to doctorate in Nuclear Physics, I have focussed my attention on two focal themes, "Cosmology and Nature of Reality". When I wrote my doctoral thesis in 1972 rejecting the hypothesis of my own supervisor, Tsai Chu, I became a little celebrity in Paris University. I was utterly confused on the turn of events but the Jury recommended my thesis, with the highest mention "Très Honorable" of Paris University.

My conclusion is, "There is no final truth in scientific research and it is a dynamic process to discover the nature of reality." Religion and science are both engaged in the exploration of ultimate reality following two different routes, namely, consciousness and material world. However, quantum mechanics has broken the barrier between these two modes of perception by accepting the role of consciousness in both theory and experiment.

Scientific interpretation of Gurbani in *SGGS* has been a recent phenomenon in Sikh history. Bhai Jodh Singh and Sirdar Kapur Singh wrote some scientific essays. Kapur Singh's *Sikhism for Modern Man* is a noteworthy addition in this area. Professor D.S. Chahal of Montreal, Canada has started a research journal, *Understanding Sikhism*, and introduced scientific and logical interpretation of Gurbani, calling it 'Nanakian Philosophy'. I do not understand why most of the members of Yahoo Group

“Gurmat Learning Zone’ are critical of Chahal’s approach. Some other scientists who are contributing to this field are D.P. Singh, V.S. Soni, G.S. Sidhu, S.S. Sandhu, Sukhraj S. Dhillon, Avtar S. Dhaliwal, Tarlochan S. Mahajan and Vasdev Sharma. An essay “Science, Religion and Mankind” by D.P. Singh is included in this book as Epilogue. It beautifully sums up the relationship between Science, Religion and Society.

In my introduction to Dr. Chahal’s book, *Japu: The Scientific and Logical Interpretation*, I referred to the various schools of interpreters of Gurbani text in SGGS. The School of Scientists of recent origin is trying to find a foothold. We must avoid calling Gurbani a branch of natural science. That will lower the divine status of Gurbani. I have tried to avoid falling in this trap. The purpose of this book is to show the glimpses of scientific vision in SGGS by interpreting its text in light of scientific theories concerning origin of life, evolution, cosmology, nature of reality and time. I could not avoid some repetition of Gurbani quotes and textual material as the book is a gist of research papers prepared and presented at some conferences/seminars during the last four decades of my teaching career. The book will cater to the needs of younger generation of Sikhs who are well versed in science and technology. The main aim of the author is to project divine thought of Sikh Gurus to the modern world. Perhaps SGGS is the only sacred text in the world which needs no twisting of its meanings to come abreast with modern science.

I must acknowledge with gratitude the encouragement I received from my friend late Professor Abdus Salam, the Nobel Laureate, Director ICTP, Trieste, Italy during my scientific research and other activities. My first book of scientific essays in Punjabi was introduced by late Professor Harbans Singh of Punjabi University, Patiala. I feel indebted to Professor Nikky-Guninder Kaur Singh, the illustrious daughter of Professor Singh, for accepting to write the Foreword of my book *Scientific Vision in Sri Guru Granth Sahib* despite her manifold engagements.

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—H.S. Virk

Interfaith Dialogue: Introductory Note

The tremendous progress of science and technology during the twentieth century has changed the world into a global village by means of fast communication. The growing materialism, selfishness and lust for power have shifted the focus from God to man. In multi-faith and multi-cultural scenario like India, there is a dire need for mutual understanding. Interfaith dialogue is the need of the hour for world unity and peaceful life.

Interfaith dialogue demands love and respect for others. It is also necessary to have knowledge about others' religious scriptures, doctrines, rituals, ethics, customs, beliefs and social attitudes, without any feeling of prejudice. It is imperative to learn the spiritual values of other religions.

Sikh Gurus mission was to promote harmony and interfaith dialogue between major creeds of India. The message of *Sri Guru Granth Sahib (SGGS)* is universal in all respects. The same message reverberates in the writings of Guru Gobind Singh:

ਮਾਨਸ ਕੀ ਜਾਤ ਸਬੈ ਏਕੈ ਪਹਿਚਾਨਬੋ॥
ਕਰਤਾ ਕਰੀਮ ਸੋਈ ਰਾਜਕ ਰਹੀਮ ਓਈ
ਦੂਸਰੇ ਨ ਭੇਦ ਕੋਈ ਭੂਲ ਭ੍ਰਮ ਮਾਨਬੋ॥...
ਦੇਹਰਾ ਮਸੀਤ ਸੋਈ ਪੂਜਾ ਔ ਨਿਵਾਸ ਓਈ
ਮਾਨਸ ਸਬੈ ਏਕ ਪੈ ਅਨੇਕ ਕੋ ਭ੍ਰਮਾਉ ਹੈ॥

Recognize all mankind as one.
The same Lord is the creator and nourisher of all,
Recognize no distinction among them.
The temple and mosque are the same,
So are the Hindu worship and Muslim prayer,
Men are all one.

(Akal Ustat, *Dasam Granth*)

During my sojourn at Paris University (1970-72), I had the privilege of being accommodated in International campus of the university. My friends from other faiths were always interested to know about Sikhism and its holy book. Some of them were kind enough to gift me copies of Holy Bible and Quran. Thus, began my preliminary studies in interfaith understanding and encounter with other faiths in an environment of mutual understanding.

My first attempt culminated in a paper, "Guru Granth Sahib and Holy Bible: An Interfaith Dialogue", presented at an International Conference held at Guru Nanak Dev University, Amritsar and published as part of the proceedings by the University Press in 2005. Comparative study of SGGS and Holy Quran, on one hand, and SGGS and Hindu sacred texts, on the other, resulted in completion of the triad presented in this book.

Twenty-first century will be a witness to two types of dialogues for promotion of world peace: (i) Science-Religion dialogue, and (ii) Inter-faith dialogue. It is my faith and conviction that SGGS has the potential to play a leading role in both these dialogues. It is imperative for Sikh institutions to work in tandem with international forums to realize the dream of Sikh Gurus:

ਜਗਤ ਜਲੰਦਾ ਰਖਿ ਲੈ ਆਪਣੀ ਕਿਰਪਾ ਧਾਰਿ ॥

ਜਿਤੁ ਦੁਆਰੈ ਉਬਰੈ ਤਿਰੈ ਲੈਹੁ ਉਬਾਰਿ ॥

God save this World by Your Mercy, it is on fire,
Save it by whatever way they approach you.

(SGGS, M. 3, p. 853)

—H.S. Virk

Foreword

Professor H. S. Virk's volume on the scientific vision in *Sri Guru Granth Sahib* is a splendid addition to Sikh scholarship. He brings his expertise in the area of Physics to the Sikh sacred text, and offers an exciting bridge between religious studies and natural sciences, which remain divided in our contemporary society.

Indeed a scientific perspective is conducive to and valuable in comprehending the scope of the vision of the Sikh Gurus. Starting with the founder Nanak, the Sikh Gurus have communicated the beauty and vastness of the cosmos in sublime poetry. Their verse is suffused with the wonder of the infinite, and consequently, *Wāheguru* has become the most popular Sikh expression. Typically it is scholars in the fields of literature, philosophy, and history who undertake an analysis of Sikh scripture, and with the inclusion of scientists, physicists, astronomers, chemists, geologists, biologists, the exegesis of the text is only enhanced. For instance, Guru Nanak's words "*pātālā pātāl lakh āgāsā āgās—worlds below worlds, worlds above worlds*" (*Japuji* : 22) leave us wide-eyed, but they acquire a real palpability and concreteness when we look at them through an astronomer's telescope. As we apply the empirical data of our Milky Way galaxy with its hundred billion stars and the scientific observations regarding billions of other galaxies, we really begin to visualize what Guru Nanak meant, and thereby gain a fuller understanding and appreciation of his verse. The scientific adventure, its observations, and factual data, do not clash with Sikh sacred scripture; they reveal its intrinsic vigour, its far-reaching insights, and its contemporary relevance. Professor Virk's interpretation of Sikh scripture in light of

scientific theories of evolution, cosmology, nature of reality, and time are therefore most fitting.

If we look closely, the passionate poetic discourse is very much like the scientific approach in that it fosters curiosity and inquisitiveness. The Guru-poets do not impose any theories on us. They do not preach at us. They do not lay out any fixed systems. They do not delineate any obligatory rules. They do not draw up a list of “do-s” and “don’ts.” There is no authorial figure or doctrine that we must submit ourselves to. To the contrary, the *Guru Granth* subtly trains us to become epistemologically open-minded and discover new tracks. If we were to focus just on the *Japuji*, the opening hymn of the Scripture, we quickly realize that its style forces us to make minute investigations. For instance, stanza 21 raises questions about our primordial origins:

What was the time, what was the hour,
What was the date, what was the day,
What was the season, what was the month,
When creation was born?

Guru Nanak’s questions are keen, and their pacing is quick. With such microscopic distinctions regarding time, hour, date, day, month, season, he provokes us to recollect our origins and really investigate our place in the universe. His exciting questions enter contemporary scientific debates about the origins of our universe: What are we? When did it all begin? How did we all evolve? The Guru mentions that even in his time, scholars were offering their own answers. But the Guru challenges all presuppositions about the workings of the universe. He accepts no theories nor presumes any knowledge himself. As Dr. Virk rightly observes, Guru Nanak “is in tune with the latest scientific findings.” Guru Nanak gives no answers; he simply incites us to examine deeply about creation: “The creator who designed this creation alone knows” (*Japuji*: 21). Devotees and scientists are equally welcome to the exhilarating challenges that lie ahead in our quest. The *Guru Granth* leaves no room for tension between scripture and science like the one we encounter between the Biblical account

of creation in Genesis and Darwin's theory of evolution—so volatile in America at the moment.

The interrogative technique is very much at the heart of the *Guru Granth*, and is extremely valuable in that it instills freedom and creativity in the minds of its readers and hearers. While opening up infinite possibilities for us to think about, it enables us to draw upon new emotional, spiritual, and intellectual reservoirs. The scriptural questions are a wonderful literary device that engages our manifold human talents. The imagination is stirred to envision the glory of our universe. Guru Nanak even asks, “*So dar kehā so ghar kehā jitu baih sarab samāle* – what kind of gate is it, what kind of a house is it, where everyone is harmoniously contained?” (*Japuji*: 27). Clearly the universe exhibits order, and the Guru-poet seems to allude to the teleological argument that philosophers of religion have elaborated upon for the existence of the Divine. This perfectly designed world has to have a supreme creator! Who is the Architect? The Builder? The Mechanic? The Engineer? Our universe constitutes the magnificent dwelling of that singular One. Science and Religion are not polarized in the Sikh text: the grandeur of secular scientific discoveries reveals the absolute magnificence and power of the sacred. The passage continues on to describe the place resounding with manifold musical melodies and overflowing with visual splendour. Actually this stanza from the *Japuji* (the Sikh morning prayer) also serves as the opening of the *Rahirās* (*rahirās* literally meaning “practice” is the Sikh daily evening hymn). So not only are our daily hectic schedules prefaced with glimpses into our world, but they are also repeated at the end of the day, exhorting us to assess: did we really think about those wondrous elements surrounding us during the course of the day? The *Guru Granth* stimulates us to go beyond just the motions of the day and realize that there is immense spiritual beauty, music, and joy in our world that we must tap into—for otherwise we merely drown in our mundane materialism.

While leading us into outer space, Sikh scripture simultaneously draws our attention to our immediate locus. The opening hymn launches readers and reciters on a journey

through the five realms of *Dharam*, *Gyan*, *Saram*, *Karam* and *Sach*—Earth, Knowledge, Beauty, Gracious Gaze, and Truth. As we make our entry into the depths of the unconscious—hidden away from the superficial level of logical knowledge, we “traverse” into wider and wider planes, into a deeper and deeper intensity. The starting point is the realm of *Dharam*. It is our present location: our place on earth. Place is important to our identity. How do we know who we are? How do we remember our past? The places we inhabit are significant to our memories and to the construction of our identity. Interestingly, Sikh scripture describes our location from a cosmic perspective, and so wherever we may be—in Patiala or Birmingham or Boston, we are simultaneously put in close touch with the distant planets and galaxies:

Rātī rutī thitī vār.

pavaṇ pāṇī agnī pātāl.

tis(u) vich(i) dhartī thāp(i) rakhī dharamsāl.

(Japuji: 34)

Amidst nights, seasons, solar and lunar days

Amidst air, water, fire and netherworld

The earth is placed, the place for righteous action.

We participate in the interplay of the various planets. Made up of nights (*rātī*) and seasons (*rutī*) and dates (*thitī*) and days (*vār*), the realm of *Dharam* expands our consciousness of time. Sitting in our homes, we are made aware of both the lunar and solar cycles and the harmonious movements created by them. The Sikh Guru functions like a natural scientist who makes us feel the billions and billions of years behind us and the billions and billions yet to come. Our daily calendars with their narrow standards of measurement acquire a much larger vista, opening us up to the wonderful patterns of our wide universe.

Our “home” is made up of the basic elements—air, water, fire, and earth—and all of their compounds. As Guru Nanak expresses the physicality of our environment, he incites us to think about the miniscule atoms that make up our cosmos. His two short verses above inform us of the interdependence of all life, and of our own microcosmic and macrocosmic interrelationship. Guru Nanak’s basic principle that we are

made up of the same stuff as the rest of our universe prefigures the Big-Bang Theory that we have all emerged from the basic matter of the universe. Rather than whisk us away up to the “heavens” far away, Sikh scripture brings us face to face with the concreteness and reality of all chemical, biological, and material shapes and forms around us *here and now*. As Galaxies, stars, planets, and we all, are not careering aimlessly—we belong to an intricate web of relationships. The Sikh poetic text inspires us to take up scientific inquiry so that we learn about the intricacies of the natural elements and our profound relationship with them. It is therefore most valuable that we receive an analysis from Dr. Virk, our eminent Physicist.

Throughout its 1430 pages, Sikh scripture underscores the importance of knowledge. In fact the second stage in the fivefold journey enunciated in the *Japuji* is that of Knowledge (*Gyān Khaṇḍ*) where the mind expands exponentially:

giān khaṇḍ maiḥ giān(u) parchaṇḍ(u)
tithai nād binod koḍ anaṇḍ(u). (Japuji, 36)

In the sphere of knowledge, knowledge blazes forth
 Mystic melodies, gaiety, and countless joys reign.

Blazing knowledge gives birth to ineffable joy (*anaṇḍu*). Gaining knowledge therefore is an ecstatic experience, one in which the individual goes beyond his or her finite self by recognizing the vastness of phenomena around. In this passage GuruNanak acknowledges “innumerable varieties of atmosphere, water, and fire—*kete pavaṇa paṇī vaisaṇtar....* The region is made up of millions of inhabited planets like our mother earth (*ketiā karam bhūmī*), countless mountains (*mer kete*), countless moons (*kete chaṇḍ*), suns (*sur*), and constellations (*maṇḍal des*). In this ever-widening horizon, terrestrial and celestial worlds are not split asunder and the earth is not put under the skies. The sacred verses urge us to unveil the astonishing links of our cosmos, which have subtle, complex and often mathematical structures.

The destination of the spiritual journey—the ultimate experience in Sikhism is a sense of infinity:

tithai khaṇḍ maṇḍal varbhaṇḍ
je ko kathai ta aṇṭ na aṇṭ. (Japuji, 37)

Here are continents, constellations, and universes,
 Their counting never ending, never ...

In this fifth and final realm, the individual comes face to face with Infinity Itself. Countless here are the continents (*khaṇḍ*), constellations (*maṇḍal*), and universes (*varbhaṇḍ*). An entry into Guru Nanak's Realm of Truth (*Sach Khaṇḍ*) reveals diverse and infinite forms. The goal of his spiritual journey is not knowledge of or communication with the figure of a majestic Theos or a God somewhere out there; it is an experience of ultimate infinity and unity here and now.

In his articulation of countless inhabited planets and suns and universes..., Guru Nanak stretches our imagination farther and farther. We discern in these scriptural verses a process that "de-centres" the earth. Our focus is directed from the earth into exhilarating vistas beyond our notions of space and time. Interestingly, Guru Nanak made these claims when the geocentric model of the universe was still dominant. Since ancient times people believed that the earth was at the centre of the universe, and Aristotle, Ptolemy and most Greek philosophers conceived that the sun, moon, stars and planets circled around the earth. The heliocentric model of Copernicus, Galileo and Kepler did not become popular till the early modern age. So it is quite amazing that Guru Nanak in his day and time would shift our attention from a geocentric model to the ultramodern view of "multiverse" (*multi* as distinct from *universe*). It is as though he was offering us a sneak preview of the highly sophisticated technological view from the Hubble ! Such scriptural verses create a hunger in us to explore the scientific mysteries of our universe. They make us appreciate the investigations of physical phenomena by our modern physicists, astrophysicists, geologists... We eagerly begin to wait for the James Webb Telescope (a joint venture between NASA, Europe, and Canada) that will be launched in 2013; replacing the Hubble, the JWT will enable us to see galaxies that are billions and billions of light years away !

And the more we know the more we realize the extent of the unknown. Knowledge therefore gets rid of egotistical notion of the self – *haumai*, the worse form of disease according

to the *Guru Granth*. Just as the heliocentric theory of the universe demolished geocentric theories, and the quantum and relativity revolutions further demolished heliocentric views to usher us into an infinite *multiverse*, the inbuilt poetic mechanism of Sikh scripture shifts our attention from the narrow insular self to something far larger. Our obsession with our own “self” tenses up our muscles, and releases harmful chemicals that exaggerate body behaviour, increase our heartbeat and blood pressure, and irritate our breathing. The holistic notion of the self that modern science is just beginning to map out is articulated throughout the Sikh sacred text, for mind (*man*) and body (*tan*) are intrinsically united. Besides opening us to the magic of infinity, the vast horizons envisioned in the Sikh text have tremendous physiological impact: they free us from negative emotions of anger, jealousy, hatred, and other such poisonous stuff. The *Guru Granth* thus serves as a treasury for the physicist, geologist, chemist, and biologist alike—and with their own and indeed different expertise, the natural scientists can tap into its inexhaustible wealth.

Overall then, Sikh scriptural portrayal of natural phenomena and infinite horizons is not just to marvel at; knowledge is not just for the sake of academic goals; scientific discoveries are not just for our material welfare. Rather, it places special possibilities and moral responsibilities on each one of us. Planet earth is “the home for righteous action” (*Japuji*: 34). And this is where the Sikh text differs from mainstream scientists. Though in the past we have had great figures like Aryabhata, Ibn Sina, Pascal, Teilhard de Chardin, and Copernicus who were at once absorbed in scientific discoveries and religious belief, many natural scientists today shy away from the topics of ethics, morality, and the divine. Though some scientists are openly hostile to religion, others like Dr. John Mather think that science should be neutral on religious matters. At a recent lecture in Dublin, the winner of the Physics Nobel Prize, Dr. Mather very delicately remarks :

We don't know if there was a creator. The scientific evidence doesn't tell us one way or the other.

The Irish Times, June 20, 2007, p. 15

Sikh scripture, however, upholds definite moral and spiritual goals. Its scientific mode of inquiry, its sense of adventure, and its amazing data of natural forces are pathways to experiencing the infinite intimately, and a springboard to ethical behaviour. By reiterating again and again that we share our cosmos with infinite species—"aṇḍaj jeraj, setaj utbhuj, i.e., those born from egg, foetus, sweat, and earth," the *Guru Granth* produces a biochemical reaction: we begin to conduct ourselves towards our entire cosmos in ways that are not divisive or endangering for anyone. The knowledge that we all evolved from the same matrix, that we all share the same elements, breaks our sense of anthropocentrism, and inculcates the values of concern, justice, compassion, and love—for all natural phenomena—alike. We can no longer be tiered into hierarchical levels with humans at the summit dominating and distorting the chorus of the planetary system. How could we overload our atmosphere with the heat-trapping gases from our cars, factories, and power plants? How could we destroy our rich rain forests? Pollute our life-giving waters? Sikh scripture makes us sensitive to our larger family, and mandates we work towards forging constructive relationships. The knowledge of infinity destroys all kinds of limitations and prejudices, and creates an all-accepting and welcoming attitude. Reading Sikh scripture is like entering a planetarium: in its mystery and thrill we become oblivious to all "isms" around us—be it anthropomorphism, racism, classism, or sexism.

I must say as a literary scholar of Sikh scripture, I am absolutely delighted that Professor Virk took up this study. Professor Virk's exploration of the symbiosis of science and religion is much needed. His topic correlates with his personal life and academic training, which makes this volume so vital. Professor Virk was drawn to the academic study of Physics early in life, and received his Masters in Science from Aligarh Muslim University (1961-63). He then went on to do research in France, and received his doctorate in Nuclear Physics from the Marie Curie University of Paris (1972). Over the decades he has taught Theory of Relativity, Nuclear and Reactor Physics, and guided Research in Radiation Physics, Earthquake Prediction,

and Micro-Nanotechnology. He has authored 15 books, prepared textbooks in physics, and lectured widely. But early in his life, Dr. Virk also imbibed a profound interest in his sacred text. Under the influence of his deeply religious mother, he was initiated to read the complete *Guru Granth* in his school days. And when he heard the melodious recitation of Maru Solhe by Sant Mohan Singh Brarewala, the theory of Relativity and the scriptural articulation of Cosmology began to chime beautifully together. So both the physical and metaphysical currents that have been resonating in his psyche for over four decades are brought out clearly and perceptively in this book.

Professor Virk's reference to Pune University in his preface sparked some lovely memories for me. Last year, I spent a part of my summer in Pune. Dr. Surjit Kaur Chahal from the Department of Philosophy, convener of the International Conference that Dr. Virk attended, was my wonderful host as well. She gave me a lot – terrific food for thought on feminist philosophy, fabulous *Sabda kīrtan*, and delicacies from Pune and Punjab. I was also fortunate to have IUCCA as my residence. As I would walk out from my apartment on to the courtyard, the inspiring statues of Aryabhata, Galileo, Newton, and Einstein would greet me. As I would walk to the dining room, the ceiling of the archway sparkled with stars that put me in touch with the distant worlds. Pune gave me a taste of the rich layering of Sikhism and Astrophysics, and Dr. Virk was the person who actually made the connections for me between the Pune University Department of Philosophy, and the Inter University Centre for Astronomy and Astrophysics (IUCAA). An endearing figure for my family, Dr. Virk holds a very special place in my mind since childhood.

In his latest book, Professor Virk joins the essential elements of Sikh philosophy with his explanation and application of many important scientific theories and models. His combination creates its own electricity. Undoubtedly, *Scientific Vision in Sri Guru Granth Sahib* promises to be an exciting reading and a gateway to new areas of research. I congratulate Singh Brothers for publishing this volume, and express my deep gratitude to them for the generosity and graciousness with

which they make publications available to scholars in far corners of the globe. Cross-disciplinary studies like this book will help to end the conflict between religion and science and allow them to grow in mutual respect.

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1

Glimpses of a Scientific Vision in *Sri Guru Granth Sahib*

Introduction

Sri Guru Granth Sahib (SGGS), the holy book of the Sikhs, is a unique creation in the history of world religions as it contains the sacred writings of Sikh Gurus and 30 other saints and bards belonging to different religious and cultural traditions of India. It is highly desirable to bring into focus both the secular characteristics and scientific vision of SGGS during the fourth centennial celebrations of its compilation by Guru Arjan Dev, the fifth Guru of the Sikhs. An attempt will be made to present some glimpses of a scientific vision in SGGS in this essay.

The Sikh religion, founded by Guru Nanak during 15th century in India, has some parallelism with renaissance and reformation movements in Europe. Guru Nanak challenged the orthodox ideas of Indian society based on Hinduism, Buddhism, Jainism and Islam. The Sikh philosophy as expounded in SGGS is unique in its epistemology. It rejects myths, rituals and dogma; as a consequence it has a universal appeal for humankind irrespective of its religious and cultural affiliations. In the holistic vision of SGGS, God, nature and man are integrally bound to each other. According to Rev. H.L. Bradshaw, "Sikh religion is a universal world faith, a message for all men. The religion preached by Guru Nanak is the faith of the New Age. The other religions contain the truth but the Sikh religion contains the fullness of truth."

The spiritual/mystical vision in SGGS is compatible with

modern science in its approach to cosmology, nature of reality, relation of microcosm to macrocosm and consciousness. SGGS advocates dual nature of reality, both transcendental and immanent at the same time. God himself transforms into creation, changing his *nirguṇa* form (energetic state) to *sarguṇa* form (material state). Space and time were created at the epoch of Big-Bang and creation process has occurred several times. The universe was created out of *siinya* phase (cosmic void) billions of years ago. There are millions and billions of stars, solar systems and galaxies in the universe and it is almost impossible and beyond human reason to account for the whole creation.

Concept of Reality in SGGS

The concept of ultimate reality propounded by Guru Nanak in the SGGS is most scientific; as a consequence, it is also dynamic and precise. Reality is one and non-dual. Hence the *SGGS Maṅglācharaṇ*¹ commences with the numeral '1' before 'Open Oorā', which represents Existence or Being. It is followed by *Satt(i) Nām* which means the supreme reality is True and it is manifested in Truth, Existence and Being. The other features of reality are its transcendence and immanence, creator person, without fear or hatred, beyond time and space, self-existent, transcendental cosmic spirit made manifest by grace of the Guru.

ੴ ਸਤਿ ਨਾਮੁ ਕਰਤਾ ਪੁਰਖੁ ਨਿਰਭਉ ਨਿਰਵੈਰੁ ਅਕਾਲ ਮੂਰਤਿ ਅਜੂਨੀ ਸੈਭੰ
ਗੁਰ ਪ੍ਰਸਾਦਿ ॥

Reality or God was in existence before the commencement of creation and time (*yugas*) during the epoch of cosmic void. God existed at the beginning of this universe, i.e., creation of space and time. God exists now and will also exist in the future (even when the universe is annihilated). The Sikh philosophy dialectically unites the ideas of God and the world. Transcendence shows that God is prior to and distinct from the world. Immanence of God represents God's connection with the world. Guru Angad defines the transcendental nature of reality²:

ਅਖੀ ਬਾਝਹੁ ਵੇਖਣਾ ਵਿਣੁ ਕੰਨਾ ਸੁਨਣਾ ॥
ਪੈਰਾ ਬਾਝਹੁ ਚਲਣਾ ਵਿਣੁ ਹਥਾ ਕਰਣਾ ॥

ਜੀਭੈ ਬਾਝਹੁ ਬੋਲਣਾ ਇਉ ਜੀਵਤ ਮਰਣਾ ॥
ਨਾਨਕ ਹੁਕਮੁ ਪਛਾਣਿ ਕੈ ਤਉ ਖਸਮੈ ਮਿਲਣਾ ॥

In this realm, one sees but without the eyes; one listens but without the ears, one walks but without the feet; one works but without the hands; one speaks but without the tongue; thus attaining life in death. O Nanak, one meets the God after realization of the divine law.

Guru Nanak discards the Vedantic concept of reality which considers this universe as an illusion or *Māyā*. His view-point is expressed in *SGGS*³:

ਸਚੇ ਤੇਰੇ ਖੰਡ ਸਚੇ ਬ੍ਰਹਮੰਡ ॥ ਸਚੇ ਤੇਰੇ ਲੋਅ ਸਚੇ ਆਕਾਰ ॥

Real are Thy Continents; Real is the Universe; Real are these forms and material objects; Thy doings are real, O Lord.

Truth is considered supreme in all religions but the *SGGS* lays more stress on truthful living than on truth⁴:

ਸਚਹੁ ਓਰੈ ਸਭੁ ਕੋ ਉਪਰਿ ਸਚੁ ਆਚਾਰੁ ॥

Truth is high but higher still is truthful living.

Hence the Sikh religion does not condemn the worldly life as *Māyā* (illusion). Reality is perceived in a holistic mode in both microcosm and macrocosm. Guru Nanak has identified the manifest reality with nature⁵:

ਨਾਨਕ ਸਚ ਦਾਤਾਰੁ ਸਿਨਾਖਤੁ ਕੁਦਰਤੀ ॥

Nanak, the beneficent Lord alone is true,
and He is revealed through His Nature.

The description of Nature by Guru Nanak in *Asā-dī-Vār*⁶ is a new dimension in the history of religious thought. In a way, scientific study of Nature is sanctioned in *SGGS*:

ਕੁਦਰਤਿ ਦਿਸੈ ਕੁਦਰਤਿ ਸੁਣੀਐ ਕੁਦਰਤਿ ਭਉ ਸੁਖ ਸਾਹੁ ॥
ਕੁਦਰਤਿ ਪਾਤਾਲੀ ਆਕਾਸੀ ਕੁਦਰਤਿ ਸਰਬ ਆਕਾਰੁ ॥

All that is visible is His Nature; All that is heard too is His Nature....

In the nether regions and skies is the manifestation of His Nature;

Of His Nature are all the manifestations.

To sum up, the concept of supreme reality as presented in *SGGS* is unique, scientific and revolutionary. It is not a mere abstraction. Its realization is possible through the practice of *Sabda* and *Naam*. Guru Nanak was blessed with the vision of God or Reality in Nature⁷:

ਗੁਰ ਨਾਨਕ ਕਉ ਪ੍ਰਭੂ ਦਿਖਾਇਆ ਜਲਿ ਥਲਿ ਤ੍ਰਿਭਵਣਿ ਰੁਖੀ ॥

The Guru hath revealed the Lord's presence to Nanak in
the three worlds;
in the woods, waters and over the earth.

Concept of *Sūnya* in *SGGS*

We find an echo of *sūnyatā* philosophy of Buddhism in *SGGS*. Guru Nanak's dialogue with Siddhas is recorded in *SGGS* as *Siddh-Gosht* which is in the form of a religious debate concerning the origin of cosmos, *sūnya*, liberation (*mukti*) and various other issues. Guru Nanak rejected the Hatha-Yoga cult of Siddhas and condemned the path of renunciation of the world followed by them. He advocated adoption of householder's life in this world and preached Sahaj-Yoga or Nām-Yoga, the Sikh way of life.

The term *Sūnya* occurs in *Siddh-Goshti*⁸ when Siddhas pose a question to Guru Nanak:

Q: ਆਦਿ ਕਉ ਕਵਨੁ ਬੀਚਾਰੁ ਕਥੀਅਲੇ ਸੁੰਨ ਕਹਾ ਘਰ ਵਾਸੈ ॥

What about the pre-cosmos state? Prior to it where the Lord of void abide?

A: ਆਦਿ ਕਉ ਬਿਸਮਾਦੁ ਬੀਚਾਰੁ ਕਥੀਅਲੇ ਸੁੰਨ ਨਿਰੰਤਰਿ ਵਾਸੁ ਲੀਆ ॥

The very thought of the pre-cosmos state lands one in a state of wonder. In the profound stillness of the *Sūnya*, the formless one pervaded in continuum then.

Various interpretations of *Sūnya* doctrine exist in *SGGS*. *Sūnya* is not equated with void or emptiness in *SGGS*. Rather, it represents the state of equipoise where Absolute Lord exists in primordial trance called *sūnya samādhī*⁹:

ਸੁੰਨ ਸਮਾਧਿ ਸਚੇ ਘਰ ਬਾਰਾ ॥

The True Lord dwells in His celestial home of deepest trance (*sūnya samādhī*).

In SGGS, Absolute Reality or God is both immanent and transcendental.¹⁰ It is formless, attributeless and hence beyond description :

ਸਰਗੁਨ ਨਿਰਗੁਨ ਨਿਰੰਕਾਰ ਸੁੰਨ ਸਮਾਧੀ ਆਪਿ ॥

He possesses all qualities, He transcends all qualities;
He is the formless Lord; He Himself is in Primal trance
(*samādhi*).

In consonance with the Buddhist philosophy of *sūnyatā*, subject-object differentiation or concept of duality does not exist in the *sūnya* state as enunciated by saint Kabir in SGGS¹¹:

ਜੀਵਨ ਮਿਰਤੁ ਨ ਦੁਖੁ ਸੁਖੁ ਬਿਆਪੈ ਸੁੰਨ ਸਮਾਧਿ ਦੋਉ ਤਹ ਨਾਹੀ ॥

No life or death, no pain or pleasure is felt there.
There is only the primal trance of *samādhi*, and hence no
duality.

Guru Arjan, the fifth Nanak, describes the primordial trance of God before the creation process starts as a manifestation of God¹²:

ਕੇਤੜਿਆ ਦਿਨ ਗੁਪਤੁ ਕਰਾਇਆ ॥

ਕੇਤੜਿਆ ਦਿਨ ਸੁੰਨਿ ਸਮਾਇਆ ॥

ਕੇਤੜਿਆ ਦਿਨ ਧੁੰਧੁਕਾਰਾ ਆਪੈ ਕਰਤਾ ਪਰਗਟਤਾ ॥

For countless days, He remained invisible.
For countless days, He remained absorbed in *Sūnya*
For countless days, there was utter darkness, and
Then the Creator revealed Himself.

However, the most beautiful elaboration of *Sūnya* doctrine (Appendix I) is given by Guru Nanak in his composition, *Mārū Solhe*, in SGGS. *Sūnya* is compared to a primal void where God exists in its full effulgence. The creation appears when God wills out of this *sūnya* phase. All the seventeen stanzas of seventeenth *Solhe* give us a vivid description of *sūnya* and there is no parallel in Indian religious literature to the spiritual vision of Guru Nanak. We may quote only a few reflections from this vision¹³:

ਸੁੰਨ ਕਲਾ ਅਪਰੰਪਰਿ ਧਾਰੀ ॥ ਆਪਿ ਨਿਰਾਲਮੁ ਅਪਰ ਅਪਾਰੀ ॥

ਆਪੈ ਕੁਦਰਤਿ ਕਰਿ ਕਰਿ ਦੇਖੈ ਸੁੰਨਹੁ ਸੁੰਨੁ ਉਪਾਇਦਾ ॥੧॥

ਪਉਣੁ ਪਾਣੀ ਸੁੰਨੈ ਤੇ ਸਾਜੇ ॥ ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ ॥

ਅਗਨਿ ਪਾਣੀ ਜੀਉ ਜੋਤਿ ਤੁਮਾਰੀ ਸੁੰਨੈ ਕਲਾ ਰਹਾਇਦਾ ॥੨॥

ਸੁੰਨਹੁ ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਉਪਾਏ ॥ ਸੁੰਨੇ ਵਰਤੇ ਜੁਗ ਸਬਾਏ ॥...
 ਸੁੰਨਹੁ ਧਰਤਿ ਅਕਾਸੁ ਉਪਾਏ ॥ ਬਿਨੁ ਬੰਮਾ ਰਾਖੇ ਸਚੁ ਕਲ ਪਾਏ ॥...
 ਪੰਚ ਤਤੁ ਸੁੰਨਹੁ ਪਰਗਾਸਾ ॥

In the *Sūnya* (Primal void), the infinite Lord assumed his Power.

He Himself is unattached, infinite and incomparable.

From the *Sūnya*, He created air and water.

He created universe and the man in the fortress of body.

From this *Sūnya*, Brahma, Vishnu and Shiva issued forth.

From this *Sūnya*, the moon, the sun and the earth were created.

They were created from *Sūnya*, and they will merge into the *Sūnya*.

From the *Sūnya*, the five elements became manifest.

When Siddhas ask Guru Nanak: "Who are they, who are attuned to this Absolute *Sūnya*?" Guru Nanak answers: "They are the *Gurmukhs* (Guru-oriented), like the God, from whom they originated." While *Sūnya* doctrine was used to promote renunciation and monasticism by its Buddhist advocates known as *sūnyavādins*, Guru Nanak condemned it and advocated the life style of a *Gurmukh*, the house-holder who faces the challenges of worldly life. Thus theoretical implications of *Sūnya* doctrine may be identical in both Buddhism and Sikhism but empirical meanings are different in the two systems.

Cosmological Ideas in SGGS

Cosmological ideas as enunciated in *SGGS* have been found to be most scientific and compatible with the modern cosmological theories of science. In *Japuji*, Guru Nanak sums up his ideas about creation of the Universe, which he elaborates further in the most precise and scientific manner in the *Raga Maru Solhe* in *SGGS*. The creation hypothesis is summed up as follows by Guru Nanak¹⁴:

ਕੀਤਾ ਪਸਾਉ ਏਕੋ ਕਵਾਉ ॥

God created the Universe by uttering a word.

Thus the problem of 'singularity' faced by the Big-Bang model of the Universe is solved by the Guru by bringing in God

as the creator of the Universe. Once this riddle is solved, the sequence of creation, its epoch and extant is described in *SGGS* in a most rational manner. Guru Nanak poses the next question in Japuji¹⁵:

ਕਵਣੁ ਸੁ ਵੇਲਾ ਵਖਤੁ ਕਵਣੁ ਕਵਣੁ ਥਿਤਿ ਕਵਣੁ ਵਾਰੁ ॥
ਕਵਣਿ ਸਿ ਰੁਤੀ ਮਾਹੁ ਕਵਣੁ ਜਿਤੁ ਹੋਆ ਆਕਾਰੁ ॥

What was the time and the moment
The day and the month,
When the world was created?

In the next stanza, Guru Nanak provides the answer¹⁶:

ਵੇਲ ਨ ਪਾਈਆ ਪੰਡਤੀ ਜਿ ਹੋਵੈ ਲੇਖੁ ਪੁਰਾਣੁ ॥
ਵਖਤੁ ਨ ਪਾਇਓ ਕਾਦੀਆ ਜਿ ਲਿਖਨਿ ਲੇਖੁ ਕੁਰਾਣੁ ॥
ਥਿਤਿ ਵਾਰੁ ਨਾ ਜੋਗੀ ਜਾਣੈ ਰੁਤਿ ਮਾਹੁ ਨਾ ਕੋਈ ॥
ਜਾ ਕਰਤਾ ਸਿਰਠੀ ਕਉ ਸਾਜੇ ਆਪੇ ਜਾਣੈ ਸੋਈ ॥

Neither the Pundit can find this date
By looking through the *Purāṇa* texts,
Nor can the Qazi tell from the *Koran*,
Neither the Yogi nor anyone else knows
The day, week, season and month of creation,
The creator who creates the World
He alone knows the time.

Guru Nanak does not want to formulate any hypothesis based on false assumptions and leaves this question open. The creation process is started under the command of God, the creator of the universe. The Guru envisages the creation of the Universe out of *Sūnya* which is devoid of matter but not of energy. Hence, a beautiful analogy with quantum concept of creation out of nothing, as a vacuum fluctuation, is established in *Rāga Mārū Solhe*¹⁷:

ਪਉਣੁ ਪਾਣੀ ਸੁਨੈ ਤੇ ਸਾਜੇ ॥
ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ ॥...
ਸੁੰਨਹੁ ਚੰਦੁ ਸੂਰਜੁ ਗੈਣਾਰੇ ॥

He created the air, water, and the Universe
Even the sun and moon from this *Sūnya*.

This wonderful drama of creation is elucidated further by Guru Nanak in his mystic reverie. Surprisingly, there is a perfect

correspondence between the epoch of 'Big-Bang' and the creation out of *Sūnya* phase as enunciated in *Mārū Solhe*, the most beautiful hymn on Sikh cosmology¹⁸ (Appendix II):

ਅਰਬਦ ਨਰਬਦ ਹੁੰਧੁਕਾਰਾ ॥ ਧਰਣਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ ॥
ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ ॥੧॥.....

For billions of years, there was nothing but utter darkness. There was neither day nor night, nor moon, nor sun, but the Lord alone sat in profound trance. Neither there was creation, nor air, nor water. There were no continents, nor underworlds, nor seven oceans nor rivers, or the flowing water. There was neither death, nor time. There was no Brahma, nor Vishnu or Shiva.

When He so willed, He created the world and supported the firmament without support. He created Brahma, Vishnu and Shiva and extended the love of mammon. He founded the continents, solar systems and underworlds, and from the Absolute self, He became manifest.

Guru Arjan Dev describes in *Sukhmani* the myriad forms of creation¹⁹:

ਕਈ ਕੋਟਿ ਖਾਣੀ ਅਰੁ ਖੰਡ ॥ ਕਈ ਕੋਟਿ ਅਕਾਸ ਬ੍ਰਹਮੰਡ ॥
ਕਈ ਕੋਟਿ ਹੋਏ ਅਵਤਾਰ ॥ ਕਈ ਜੁਗਤਿ ਕੀਨੋ ਬਿਸਥਾਰ ॥
ਕਈ ਬਾਰ ਪਸਰਿਓ ਪਾਸਾਰ ॥ ਸਦਾ ਸਦਾ ਇਕੁ ਏਕੰਕਾਰ ॥

There are millions and millions of galaxies and solar systems in the universe. The phenomenon of creation has occurred so many times. But the one Lord remains forever and ever.

The riddle of creation of the universe will remain an enigma for cosmologists and there is no final word yet in cosmology. About the present theories and models, we may conclude with a quotation from *Benti Chaupai* in *Dasam Granth*²⁰:

ਆਪੁ ਆਪਨੀ ਬੁਧਿ ਹੈ ਜੇਤੀ ॥ ਬਰਨਤ ਭਿੰਨ ਭਿੰਨ ਤੁਹਿ ਤੇਤੀ ॥
ਤੁਮਰਾ ਲਖਾ ਨ ਜਾਇ ਪਸਾਰਾ ॥ ਕਿਹ ਬਿਧਿ ਸਜਾ ਪ੍ਰਥਮ ਸੰਸਾਰਾ ॥

Everyone explains the creation process according to his intellect,

But no one can tell, O Lord,

How you first created the universe.

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[M=1, 2, 3, 4, 5 represents the succession number of Sikh Gurus to the House of Guru Nanak and p. to the page of SGGS].
2. SGGS, M. 2, p. 139.
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Cosmological Ideas in Science and Religion

Abstract

Cosmology deals with the problem of the creation of the universe. Almost all religions have dealt with the problem of creation of the universe from time immemorial in their sacred texts. Guru Nanak, the founder of the Sikh faith, critically examined the theories of creation of the universe prevalent in India before his advent, from pre-historic times to the end of 15th century. The seeds of modern cosmology, namely, the Big-Bang cosmology are explicitly visible in the sacred writings of Guru Nanak and his successors, compiled during 1604 in the form of *Sri Guru Granth Sahib*, the Sikh holy book. The cosmological hypothesis of this sacred text has been compared with other texts, both of oriental and occidental traditions. It has been observed that scientific evidence supports the Big-Bang model of cosmology. An overview of the scientific theories has also been given for sake of comparison and to appreciate the revelatory but scientific vision of Guru Nanak.

Introduction

Scientists use physical and chemical methods to discover the secrets of universe while the Prophets use divine intuition to reveal these secrets. All their conclusions may not coincide but their objective remains the same to explore the secret of Laws of Universe for the benefit of the humanity so that humanity can live peacefully on this tiny planet, the earth.

The most important question discussed by the Prophets

and scientists is the origin of the universe. The question has been answered in two different ways. One line of thought is that the universe came into existence itself. The other line of thought is that there are signs of designing and planning in the universe (Intelligent Design); therefore, it must have been created by a superpower.

There are a large number of theories about the creation of the universe but so far 'Big-Bang Theory' is widely accepted by many scientists. However, with every new scientific discovery the theory may undergo a drastic change in the future. One must keep in mind that theories are based on some scientific information and use of logic and it will change as soon as more facts are discovered. Many theologians emphasize that theories propounded by scientists change with the time, therefore, the science is not a stable field. On the other hand they say that the God has revealed the theology to the deities, prophets, Gurus; therefore, it cannot change. But one should also not forget that God has also revealed principles of science, Laws of Universe, to the scientists. Therefore, science and theology cannot contradict each other since both have been revealed by God.¹

(A) Cosmological Ideas in Science

Cosmology²⁻⁵ deals with the problem of creation of the Universe. It has played a decisive role in the conflict between science and religion. Various cosmological theories and models have been proposed in both science and religion. Newton's approach towards cosmology was metaphysical and he considered the creation of the Universe as an act of God. In his system, space and time appear as absolutes and the earth occupies a unique position in the Universe. More than a century later, Kant and Laplace put forward their views, together known as Gas-Cloud hypothesis. It considers the creation of the Universe out of gases and vapours such as hydrogen, methane, carbon dioxide, cyanogen and water. The planets and the sun were created out of the same nebular gas medium. A similar view has been expressed in *SGGS*⁶:

ਸਾਚੇ ਤੇ ਪਵਨਾ ਭਇਆ ਪਵਨੇ ਤੇ ਜਲ ਹੋਇ ॥
ਜਲ ਤੇ ਤ੍ਰਿਭਵਤੁ ਸਾਜਿਆ ਘਟਿ ਘਟਿ ਜੋਤਿ ਸਮੋਇ ॥

God created the air, from air came water and from water the world was created. God spirit permeates all the beings.

Relativistic Models of the Universe

The real investigation of the cosmological problem begins with the advent of Einstein's general theory of relativity presented in 1915, which is in reality a cosmological theory. Each cosmological solution of the field equations of Einstein gives us a model of the Universe, by which is meant an account of the history of the Universe. Of the many models available, only one can be correct, as we have only one actual universe. We will describe several models which have been proposed till date.

A cosmological model is intended to represent the positions and motions of the clusters of galaxies. The basic feature in the history of the universe is the expansion. For relativistic cosmological models, the expansion curve is obtained from solutions of Einstein's equations.

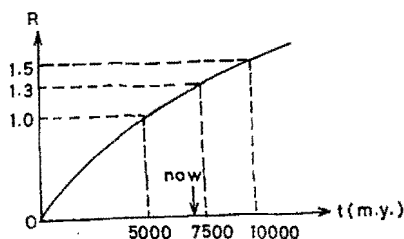
Let us fix attention on two typical galaxies A and B, and suppose that at a certain moment the distance between A and B is 1 unit: the unit could be any large distance, say 100 million light years. Before this moment the distance AB will be less and afterwards it will be greater. If R is used to denote the distance AB, then R depends on the time. Different models give different graphs for the dependence of R on the time. Accordingly we get these models:

1. Einstein-De Sitter Model,
2. Cycloidal Model,
3. Hyperbolic Model.

1. The Einstein-De Sitter Model: It is simplest relativistic model which starts from a 'singular state'. This means that function R is Zero in the beginning so that distance AB was zero, and the distance between all pairs of galaxies was zero. Matter was so closely packed that density was infinite. In this model, R increases rapidly from zero, the rate of increase

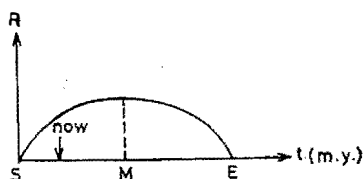
becomes less rapid as time goes on. According to this model, the present time is about 7,000 million years after the singular state.

De-Sitter Model



2. Cycloidal Model: In this model, R increases to a maximum and then decreases to zero again. The distance AB between the two galaxies increases up to time M and after time M , it starts decreasing, until at E , the distance AB is again zero. The event 'E' which is known as 'end of the world' is the most remarkable feature of this model. Both S and E represent singular states.

Cycloidal Model

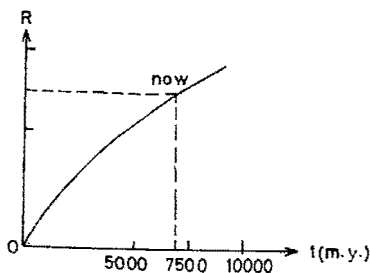


In the cycloidal model, light from distant galaxies is shifted towards the red while the expansion is going on. During the second half there is a contraction and the red shift becomes a violet shift. During contraction the night sky will appear as bright as the day. According to this model the space is finite and the expansion of universe can be explained on the analogy of an expanding balloon.

3. Hyperbolic Model: This model has an expansion curve similar to that of the Einstein-de Sitter Model, but it rises rather more steeply. The model starts from a singular state and expands forever; its volume is infinite.

We can sum up all three models, based on their expansion curves, as parabolic, elliptic and hyperbolic, respectively.

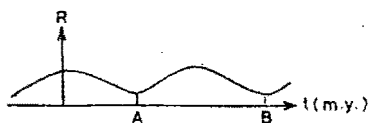
Hyperbolic Model



Singular State and a job for God: The three models of the universe described above all start from a condition of infinite density which is called a singular state. What happened before the expansion started? Einstein's equations break down at the singular state and our models fail to explain the history of the universe backward. Scientists have to invoke God to get rid of singularity problem and for starting expansion.

Oscillating Model: To get rid of the singular states, the oscillating model has been proposed. Each contracting period in the universe's history ends in a smooth transition to subsequent period of expansion. The universe is infinite in time but finite in space. There are no singular states and hence no need of bringing in the creator. The universe continues forever following the cycles of expansion and contraction.

Oscillating Model



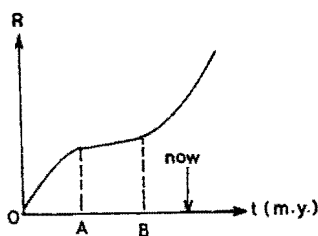
Relativistic Models with Cosmic Repulsion

1. Einstein Model: This model is static with its space curved and of finite volume. Einstein assumed a static universe, and to

accommodate for it, he introduced an antigravity unit called cosmological term which is multiplied by a cosmological constant. The reason for its inclusion was simply to provide for a static cosmic equilibrium. The assumption that cosmic bodies are continuously experiencing mutual gravitational pull would eventually cause the cosmic bodies to converge and become one. In other words, the universe would collapse. To overcome gravitational attraction, Einstein introduced a λ term in his field equations to bring in repulsion at cosmological distances. With Hubble's observation of an expanding universe, Einstein regretted modifying his theory of general relativity with the cosmological constant and called it "the biggest blunder of my life."

2. Lemaitre's Model: This model starts from a singular state at O, and begins to expand rapidly. The expansion slows down and for a period AB the conditions are almost static as the gravitational attraction is being balanced by cosmic repulsion. After AB, the repulsion predominates and the universe expands continuously forever under the influence of the λ term alone. If there is no cosmic repulsion, Lemaitre model would be similar to cycloidal model with its curved space and a finite volume.

Lemaitre Model



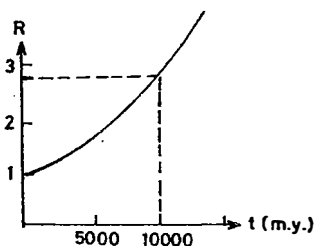
Lemaitre believes his model to be a correct representation of the real universe. In particular, he has pictured the initial singular state as being the explosion of the 'primeval atom' as mentioned in the next section.

Steady State Theory/Model

It is important to understand that steady state universe

is not static. Change is going on all the time, but the overall picture does not alter. There is continuous creation of matter and unceasing motion. But the amount of matter created is so small, that it has not been detected by any experiment so far.

Steady State Model



The most controversial feature of the theory is the creation of matter. It is created not out of radiation or something else, but out of 'nothing'. The rate of creation is so small and the universe so large that if one hydrogen atom is supposed to be created in a room of normal size every 5000 years, there will be enough matter for 50,000 Suns every second.

This model is based on cosmological principle: 'Universe is the same for all observers, for all the time and space to come'. There is no singular state to be explained. The main objections to this model are:

- (i) It does not obey the law of conservation of energy, and
- (ii) no explanation is given of why the universe is expanding as there are no field equations, as in relativistic models, with or without λ term. To detect creation of matter, would be a final test for this model.

Fred Hoyle and Jayant Narlikar (1962-63) have introduced field equations to explain for expansion of the universe. The observations of M. Royle of Cambridge University on distant radio galaxies contradict the predictions of Hoyle and his group. The detection of cosmic microwave background radiation at 3°K has dealt the final death blow to this model.

Big-Bang Theory/Model

The creation or expansion of the universe from singular state is referred to as 'Big-Bang'. Its most ambitious and detailed theory is that of Gamow and collaborators, known as $\alpha\beta\gamma$ theory. They suppose that universe started from a very dense, hot mass of neutrons which decayed into protons and electrons. These combined to form complex nuclei. The temperature during this phase was 10,000 million degrees Kelvin and most of the heavy elements were built up in the first 30 minutes of the expansion. The $\alpha\beta\gamma$ theory fails to explain the production of heavier elements after helium. Lemaitre explains the big bang from a primeval atom—an atom which contained all the matter of the universe.

The Big-Bang theory is an effort to explain what happened at the very beginning of our universe. Discoveries in astronomy and physics have shown beyond a reasonable doubt that our universe did in fact have a beginning. Prior to that moment there was nothing; during and after that moment there was something: our universe. The Big-Bang theory is an effort to explain what happened during and after that moment.

Our universe sprang into existence as a "singularity" around 13.7 billion years ago (some say about 15 billions). What is a "singularity" and where does it come from? Well, to be honest, we don't know for sure. Singularities are zones which defy our current understanding of physics. They are thought to exist at the core of "black holes." According to Big-Bang model, our universe is thought to have begun as an infinitesimally small, infinitely hot, infinitely dense, something—a singularity. Where did it come from? We don't know. Why did it appear? We don't know.

Mathematically speaking, the moment of origin (time, $t=0$) of the universe is called a *singularity*; the density of matter and space-time curvature is infinite and the distance between any two "observers" is zero. Interestingly, the laws of physics, as are known to us, breakdown here. To understand the events close to the singularity, rules of quantum mechanics are employed.

In 1964, Arno Penzia and Robert Wilson⁷ discovered very

high frequency radio microwaves coming from all directions of the sky. They believed that these microwaves were the remnants of the “echo” of the Big-Bang, which is still pulsating and reverberating through the universe. Evidence collected by astronomers during the last 50 years confirms the hypothesis of expanding Universe and it is the basis of Big-Bang cosmology.

According to current scientific understanding, origin of the universe is best understood by reversing the expansion process. In the reverse, more than 100 billion galaxies with billions of stars are compressed together. As it shrinks the temperature and the density of the primordial plasma rises. Extrapolating to the point of origin the universe would have begun as a point of extremely high temperature and density. The Big-Bang occurred at this stage and space and time came into existence. It was believed that matter is made of protons and neutrons, but with the advances in particle physics these have been replaced by their smaller constituents called *quarks*. Before protons and neutrons the universe is said to consist of quarks, electrons and photons. Using this model the history of the universe has been reconstructed to one thousand-billionth (10^{-12}) of a second after the Big-Bang.

Inflation Theory of Big-Bang

Alan Guth of MIT proposed Inflation theory^a to explain the rapid expansion of Universe. According to this theory, the size of the Universe doubles every 10^{-35} of a second and age of the Universe is about 15 billion years. Quantum physics allows the Universe to appear out of nothing at all, as a vacuum fluctuation. It should be noted that “quantum nothingness” is different from absolute nothingness (complete emptiness). Chaotic inflation led to the sudden expansion of the Universe out of a quantum fluctuation.

The seed of the Universe is considered to be a ‘magnetic monopole’, according to a new version of inflation theory. Hubble Telescope has provided some most useful data to clinch the issues in Big-Bang Cosmology.

In 1992 COBE satellite discovered hot and cold patches

in the cosmic background radiation that are characterized as primeval ripples. These patches have travelled undisturbed since the cooling of the universe, three hundred thousand years after the Big-Bang. George Smoot, 2006 Nobel Laureate, has discovered the long-sought hard evidence for the Big-Bang origin of Universe on the basis of small fluctuations found with the help of NASA's Cosmic Background Explorer (COBE).⁹

(B) Cosmological Ideas in Religion

Hindu Religion

Let us examine the approach of Hindu religion to the problems of cosmology. The world's most ancient text of religious literature, viz. *Rig Veda* deals with the problem of creation of universe in its famous chapter¹⁰ 'Nasdiya Sukt'. The Vedic seer sang in *Rig Veda* thus:

Who can tell us surely?
From what and how this universe has risen?
And whether or not till after it the gods lived?
Who then can know from what it has arisen?
The source from which this universe has risen
And whether it was made or uncreated,
He only knows, who from the highest heaven rules,
The all-seeing Lord or does not He know?

We may quote some more hymns on the creation of the Universe from *Atharva Veda*.¹¹ It is known as Golden Womb (*Hiranyagarbha*) hypothesis which assumes Universe as extension of God. The division of creation into terrestrial, celestial and interspatial regions is more akin to Greek and Islamic traditions. The relationship of man and universe is also demonstrated through this division into three realms in a perfectly logical manner :

In the beginning was *Hiranyagarbha*, the seed of Elemental Existence, the only Lord of all that was born. The whole of this Universe is stationed in the Omnipresent and the Omnipotent God.

We see Him in various forms. He brings to light all these Worlds. Him they call the *Kala*, Infinite, pervading the Infinite Space.

In this creation are held in balance the three regions, terrestrial, interspatial and celestial, and the three divine realms pertaining to body, mind and spirit provided with three eternal functions—physical, mental and transcendental.

Upanishadas, the great treatises on Indian Philosophy, also deal with the cosmological problem. According to Deussen¹² there are four views of creation in Hindu philosophy based on *Upanishadas*:

1. Matter is eternal and *Purusha* (creator) has always been independent of God. God does not create the matter but moulds it into creation as a potter makes the earthen pots.
2. *Purusha* is the cause and creator of matter. But after the creation, God does not interfere in its working and it continues according to its own fundamental laws.
3. God himself transforms into creation i.e., changing his *Nirguna* form into *Saguna* form.
4. Creation is a play of *Māyā*. It is a mere illusion. Only God is real.

Hinduism has several funny creation beliefs in the *Purāṇa* literature.¹³ According to *Vāmapurāṇa*, Brahma lay within an egg and after it broke the sacred word *Om* emanated. The first sound was *bhuḥ*, the second *bhuvaha* and the third *svaha*. The sun emerged from the egg, in the centre of which was the creator Brahma.

In *Brahmaṇḍa Purāṇa*, Brahma hatched from a golden egg and made the sky and earth from the eggshell. After creating rocks and mountains, Brahma created Saraswati and fell passionately in love with her. He persuaded her to marry him and at the end of the wedding night Manu, the first human being was born. To him Brahma gave eight gifts—five senses, movement, reproduction and intelligence.

The age of the universe according to the Hindu view is infinite. There are innumerable *Brahmas* who are employed in the process of creation. Each *Brahma* has a life-time of 100 years. On astronomical time-scale the year is much bigger than our solar year. Some of the units are given as follows :

- 1 *Maha Yuga* = S+T+D+K (Four *Yugas*)*
 = 432×10^4 Solar years
 1000 *Maha Yugas* = Kalp=Day=Night (of *Brahma*).
 1000 *Maha Yugas* = 14 *Manvantar* + 15 Junctions.

After working out the above relation we can get:

Age of *Brahma* = 3.15×10^{14} Solar years.

For an analogy if we represent the cosmological time as still water in a pond, then the cycles of creation can be represented by the surface ripples which continue forever. Thus the age of universe in this system is infinite and the creation—annihilation (*Utpat-Parlo*) are mere phases in it. *Utpat* corresponds to the Day and *Parlo* to the Night of *Brahma*.

Semitic Religions

Judeo-Christian Tradition

According to the Holy *Bible*, the creation of universe is the manifestation of God. The whole process of creation was completed in six days. The first book of Moses, called *Genesis*,¹⁴ opens with the lines: In the beginning God created the heaven and the earth. God created the universe out of nothing (*ex nihilo*) through a series of commands :

And God said, "Let there be light; and there was light" (Gen. 1:3). "Let there be a firmament in the midst of the waters, and let it separate the waters from the waters" (Gen.1:6). And God said, "Let the waters under the heavens be gathered together into one place, and let the dry land appear." And it was so (Gen. 1:9). "Let there be lights in the firmament of the heavens to separate the day from the night; and let them be for signs and for seasons and for days and years" (Gen. 1:14).

And God said, "Let the waters bring forth swarms of living creatures, and let birds fly above the earth across the firmament of the heavens" (Gen. 1:20). Then God said, "Let us make man in our image, after our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the

¹⁴ S, T, D, and K correspond to *Satīyuga*, *Treta*, *Dwapar* and *Kaliyug*, respectively.

earth, and over every creeping thing that creeps upon the earth" (Gen. 1:26).

In 1650, Bishop Usher of Ireland calculated the date of creation as 4004 B.C. according to the 'Genesis' story of the *Bible*. This date has been pushed back by a very long span that has elapsed since the appearance of man on earth confirmed by recent archaeological finds.

The end of the world too is envisaged in the *Bible*¹⁵: "The heavens shall pass away with a great noise, the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up."

Islamic tradition

According to a recent study of Cosmology in *Quran*, Kamel Ben Salem¹⁶ tries to interpret Quranic verses in the light of scientific theories of creation of Universe. The Holy *Quran* speaks of creation as a Big-Bang. When Allah spoke the word 'Kun' there was creation all around. The *Quran* states that the creation phenomenon in the universe is a continuous process (*Sura 30, verse 11*):

"It is God Who begins (the process of) creation; then repeats it."

According to the Islamic view, there are seven heavens and seven earths (*Sura 65, verse 12*):

"God is the One Who created seven heavens and of the earth a similar number."

The *Quran* almost repeats the Biblical version of the genesis story that God created the Universe with all its manifestations in just six days but does not state that God took rest on seventh day (*Sura 50, verse 38*):

"We created the heavens, the earth and what is between them in six days and no weariness touched Us."

Some accounts deal with the creation more specifically stating that the earth was created on a Sunday and Monday. On Tuesday, He created the mountains and on Wednesday trees, water and cultivation came into existence. On Thursday

God created heaven and the stars, sun and moon, and the angels were created on a Friday.

The Universe is divided into three realms as shown in Hindu view of creation in *Atharva Veda*: those which are found in heavens; those which are found on Earth; those which are found between the heavens and the Earth (*Sura 32, verse 4*):

“God is He Who has created the heavens and the earth, and all that is between them in six days.”

The *Quran* says that the universe was created from a gaseous mass with fine particles, the elements of which were initially soldered to form one unit which will later be divided. Expansion started after the build up operation and it continues until now (*Sura 51, verse 47*):

“The heaven, We have built it with power, verily We are expanding it.”

The *Quran* advocates a cyclic view of the Universe as in Hindu and Sikh Cosmologies, and specifies that after expansion there will be a collapse, then a re-birth in exactly the same way as at the beginning (*Sura 30, verse 11*):

“It is God Who begins (the process of) creation; then repeats it.”

According to Ben Salem, the following chronology may be established according to the verses concerning the creation and the evolution of the universe in *Quran*, provided we consider the length of God’s day equivalent to one thousand sidereal years (*Sura 22, verse 47*):

“...in a period of time (*yaum*) whereof the measure is a thousand years of your reckoning.”

Using the method of extrapolation based on *Quranic* verses (*Sura 41, verses 9-10*; *Sura 70, verse 4*):

The age of the Earth = 4.56 billion years

The age of the Universe = 13.7 billion years

Cosmology in Sikh Religion

It is my considered opinion that Sikh Cosmology as

enunciated in *SGGS* has been found to be most scientific and compatible with the modern cosmological theories of science. Guru Nanak challenges the Hindu world-view as archaic and based on dogma and mythology. In *Japuji*, Guru Nanak sums up his ideas about creation of the Universe, which he elaborates further in the most precise and scientific manner in the *Rāga Māru Solhe* in *SGGS*. The creation hypothesis is summed up as follows by Guru Nanak¹⁷:

ਕੀਤਾ ਪਸਾਉ ਏਕੋ ਕਵਾਉ ॥ ਤਿਸ ਤੇ ਹੋਏ ਲਖ ਦਰੀਆਉ ॥

God created the Universe by uttering a word.

Thus the problem of 'singularity' faced by the Big-Bang model of the Universe is solved by the Guru by bringing in God as the creator of the Universe. Once this riddle is solved, the sequence of creation, its epoch and extent is described in *SGGS* in a most rational manner. Guru Nanak poses the next question in *Japuji*¹⁸:

ਕਵਣੁ ਸੁ ਵੇਲਾ ਵਖਤੁ ਕਵਣੁ ਕਵਣੁ ਥਿਤਿ ਕਵਣੁ ਵਾਰੁ ॥

ਕਵਣਿ ਸਿ ਰੁਤੀ ਮਾਹੁ ਕਵਣੁ ਜਿਤੁ ਹੋਆ ਆਕਾਰੁ ॥

What was the time, the moment and the day?

What was the season and the month?

When the Universe was created.

In the next stanza, Guru Nanak provides the answer¹⁹:

ਵੇਲ ਨ ਪਾਈਆ ਪੰਡਤੀ ਜਿ ਹੋਵੈ ਲੇਖੁ ਪੁਰਾਣੁ ॥

ਵਖਤੁ ਨ ਪਾਇਓ ਕਾਦੀਆ ਜਿ ਲਿਖਨਿ ਲੇਖੁ ਕੁਰਾਣੁ ॥

ਥਿਤਿ ਵਾਰੁ ਨਾ ਜੋਗੀ ਜਾਣੈ ਰੁਤਿ ਮਾਹੁ ਨਾ ਕੋਈ ॥

ਜਾ ਕਰਤਾ ਸਿਰਠੀ ਕਉ ਸਾਜੇ ਅਪੇ ਜਾਣੈ ਸੋਈ ॥

Neither the Pundit can find this date

by looking through the *Purāṇa* texts,

Nor can the Qazi tell from the *Quran*,

Neither the Yogi nor anyone else knows,

The day, week, season and month of creation,

The creator who creates the Universe,

He alone knows the time.

Guru Nanak does not want to formulate any hypothesis based on false assumptions and leaves this question open. The creation process is started under the command of God, the

creator of the universe. The Guru envisages the creation of the Universe out of 'Sūnya' which is devoid of matter but not of energy. Hence a beautiful analogy with quantum concept of creation 'out of nothing' as a vacuum fluctuation is established in *Rāga Māru Solhe*²⁰:

ਸੁੰਨ ਕਲਾ ਅਪਰੰਪਰਿ ਧਾਰੀ॥...

ਪਉਣੁ ਪਾਣੀ ਸੁੰਨੈ ਤੇ ਸਾਜੇ॥

ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ॥

In the Primal Void, the Infinite Lord assumed His Power
He created the air, water, earth and sky;

He created universe and the man in the fortress of body.

This wonderful drama of creation is elucidated further by Guru Nanak in his mystic reverie. Surprisingly, there is a perfect correspondence between the epoch of 'Big-Bang' and the creation out of *Sūnya* phase as enunciated in *Māru Solhe*, the most beautiful hymn on Sikh Cosmology (Appendix II)²¹:

ਅਰਬਦ ਨਰਬਦ ਹੁੰਦੁਕਾਰਾ॥ ਧਰਣਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ॥

ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ॥੧॥

ਖਾਣੀ ਨ ਬਾਣੀ ਪਉਣ ਨ ਪਾਣੀ॥ ਓਪਤਿ ਖਪਤਿ ਨ ਆਵਣ ਜਾਣੀ॥

ਖੰਡ ਪਤਾਲ ਸਪਤ ਨਹੀ ਸਾਗਰ ਨਦੀ ਨ ਨੀਰੁ ਵਹਾਇਦਾ॥੨॥...

ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਨ ਕੋਈ॥ ਅਵਰੁ ਨ ਦੀਸੈ ਏਕੋ ਸੋਈ॥...

ਜਾ ਤਿਸੁ ਭਾਣਾ ਤਾ ਜਗਤੁ ਉਪਾਇਆ॥ ਬਾਬੁ ਕਲਾ ਆਡਾਣੁ ਰਹਾਇਆ॥

ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਉਪਾਏ ਮਾਇਆ ਮੋਹੁ ਵਧਾਇਦਾ॥੧੪॥...

ਖੰਡ ਬ੍ਰਹਮੰਡ ਪਾਤਾਲ ਅਰੰਭੇ ਗੁਪਤਗੁ ਪਰਗਟੀ ਆਇਦਾ॥੧੫॥

For billions of years, there was nothing but utter darkness. There was neither day nor night, nor moon, nor sun, but the Lord alone sat in profound trance. Neither there was creation, nor air, nor water. There were no continents, nor underworlds, nor seven oceans nor rivers, or the flowing water. There was neither death, nor time. There was no Brahma, nor Vishnu or Shiva; non else but the One Lord.

When He so willed, He created the world and supported the firmament without support. He created Brahma, Vishnu and Shiva and extended the love of mammon. He founded the continents, solar systems and underworlds, and from the Absolute self, He became manifest.

Guru Arjan Dev, the fifth Sikh Guru and compiler of SGGS, describes in *Sukhmani* the myriad forms of creation. The cyclic theory of creation is accepted as a norm in SGGS²²:

ਕਈ ਕੋਟਿ ਖਾਣੀ ਅਰੁ ਖੰਡ ॥ ਕਈ ਕੋਟਿ ਅਕਾਸ ਬ੍ਰਹਮੰਡ ॥
ਕਈ ਕੋਟਿ ਹੋਏ ਅਵਤਾਰ ॥ ਕਈ ਜੁਗਤਿ ਕੀਨੋ ਬਿਸਥਾਰ ॥
ਕਈ ਬਾਰ ਪਸਰਿਓ ਪਾਸਾਰ ॥ ਸਦਾ ਸਦਾ ਇਕੁ ਏਕੰਕਾਰ ॥

There are millions and millions of galaxies and solar systems in the universe. The phenomenon of creation has occurred so many times. But the one Lord remains forever and ever.

The universe is still expanding since the Big-Bang occurred and no limit has been established according to the present day knowledge of science. Guru Nanak explains infiniteness of universe in his own inimitable style after rejecting the hypotheses put forward by religions of both the oriental and occidental traditions, as follows²³:

ਪਾਤਾਲਾ ਪਾਤਾਲ ਲਖ ਅਰਾਸਾ ਅਰਾਸਾ ॥
ਓੜਕ ਓੜਕ ਭਾਲਿ ਥਕੇ ਵੇਦ ਕਹਨਿ ਇਕ ਵਾਤ ॥
ਸਹਸ ਅਠਾਰਹ ਕਹਨਿ ਕਤੇਬਾ ਅਸੁਲੁ ਇਕੁ ਧਾਤੁ ॥

There are hundreds of thousands of nether worlds, and hundreds of thousands of skies.
After great research the Vedas have failed to come to a definite conclusion.
The Semitic books say that there are eighteen thousand worlds, and that is their claim.

However, Guru Nanak does not enter into any mathematical rigmaroles to make an assessment or count of the celestial bodies comprising our Universe. After quoting the prevalent tradition or information available at that time, Guru Nanak records his own observations in SGGS in the form of his mystic reverie. He says that the cosmos (universe) contains countless number of celestial bodies. The real number would be known only to the God, the creator of the Universe²³:

ਲੇਖਾ ਹੋਇ ਤ ਲਿਖੀਐ ਲੇਖੈ ਹੋਇ ਵਿਟਾਸੁ ॥
ਨਾਨਕ ਵਡਾ ਆਖੀਐ ਆਪੇ ਜਾਣੈ ਆਪੁ ॥

It cannot be possible to count (number of the celestial bodies in the universe)

Because the accounting person may reach the end of his
 life during counting,
 It will still be incomplete.
 Oh Nanak, God is the Great,
 Who knows the account (of the celestial bodies in the
 universe).

According to the present scientific information available there are billions of galaxies and each galaxy is composed of billions of stars and their planets and moons. Our sun, having nine planets revolving around it, is one of the billions of stars of our galaxy, the Milky Way.

The riddle of creation of the Universe will remain an enigma for cosmologists and there is no final word yet in cosmology. About the present theories and models, we may conclude with a quotation from the *Benti Chaupai* in *Dasam Granth*²⁴ :

ਆਪ ਆਪਨੀ ਬੁਧਿ ਹੈ ਜੇਤੀ ॥ ਬਰਨਤ ਭਿੰਨ ਭਿੰਨ ਤੁਹਿ ਤੇਤੀ ॥
 ਤੁਮਰਾ ਲਖਾ ਨ ਜਾਇ ਪਸਾਰਾ ॥ ਕਿਹ ਬਿਧਿ ਸਜਾ ਪ੍ਰਥਮ ਸੰਸਾਰਾ ॥

Everyone explains the creation process according to his
 own intellect,
 But no one can tell, O Lord,
 How you first created the universe.

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3

Concept of Reality in *Sri Guru Granth Sahib* and its Physical, Metaphysical and Mystical Aspects

Abstract

The concept of Reality and its various interpretations exist both in science and religion. There has been a dynamic change in the physical interpretation of Reality from Aristotle to Einstein. The advent of Relativity theory and Quantum mechanics in modern physics led to formulations of new concepts regarding space, time, matter and reality. The introduction of Uncertainty Principle by Heisenberg and the concept of dual nature of matter and radiation by Louis de Broglie gave a serious blow to the philosophy of determinism based on Newtonian world-view. The great debates between Einstein and Bohr at Solvay Conferences about the inadequacy of quantum mechanics to describe physical aspect of Reality are a part of history of science now. EPR paradox and Bell's theorem have introduced the idea of connectedness and consciousness in quantum Reality.

To the Indian philosopher, experience is the ultimate test of truth or Reality. Since the Reality is trans-empirical, it cannot be known through sense experience in the way in which empirical/scientific knowledge is gained. Reality is comprehended through intuitive experience for it transcends both the rational and the sensory aspects of human experience. The concept of Ultimate Reality in the *Sri Guru Granth Sahib*

(SGGS) is most scientific, precise and dynamic in nature. It is summed up in *Maṅglācharaṇ* (the Commencing Verse of the SGGS). According to the Sikh philosophy, Reality is both transcendental and immanent, i.e., it has dual nature as *nirguṇa* and *sarguṇa* at the same time. It was experienced by Guru Nanak in Nature and the whole of the SGGS is a vision of Ultimate Reality.

Introduction

What is real? What is the universe made of? How does it work? What is the origin of life in this universe? Who created this universe? Physicists and philosophers have been asking these questions since the dawn of civilization. The concept of Reality has undergone a revolutionary change ever since the time of Greek philosophers. It was from the observation of celestial motions, of the regularity of the planetary motions and change of seasons that the ancient astronomers came to the profound message of the order of the Universe. The philosophical quest for the ultimate Reality, using reason and speculation, transcended the boundaries of physical Reality. Recent developments in physics have turned out to be a boomerang experience for the physicist's conception of Reality. Today many scientists explore the "metaphysics" of physics with their powerful instruments. The new insights of the modern physics into the mystery of the universe have prepared the stage for a dialogue between science and religion. Our aim in this study is to probe analogical parallels that exist between physics and mysticism for a new understanding of Reality, with special reference to *Sri Guru Granth Sahib*, the holy book of the Sikh religion.

Physical Aspects of Reality

Classical notions about Reality: Aristotle¹ introduced many metaphysical principles in physics. In his system, everything had a natural place and every object had its own nature. He made a sharp distinction between celestial and terrestrial world, the latter being imperfect, corruptible, and

prone to constant change; while the former perfect, incorruptible and immutable. Aristotle's philosophy of nature was comprehensive and highly appealing to the common sense wisdom of the day. It gave birth to monotheistic conceptions of God and a dualistic vision of Reality. The germs of an anthropocentric worldview were inherent in Aristotle's philosophy of science.

Newtonian mechanics gave birth to a mechanical philosophy of nature. It claimed that everything could be explained in terms of matter in motion and the interaction between the material particles. This meant that all things could be explained in terms of just four fundamental concepts: space, time, mass and force. A mechanistic worldview or the clockwork universe was the immediate consequence of Newtonian physics. The divine hand, having set it right in the beginning, left it undisturbed. There was no scope for divine intervention, chance and indeterminacy in a deterministic worldview. Reality can be known by using mathematical tools and all events become predictable in future.

In the beginning of 20th century, the advent of special theory of relativity dealt a death blow to the mechanical philosophy of nature. Newtonian mechanics held space, time and mass to be absolute, but relativity theory showed them to be relative. Quantum mechanics introduced the concept of indeterminacy and chance in physical measurements. It gave a serious jolt to the mechanical philosophy of nature.

Scientists of Vienna circle, better known as Logical Positivists, believed that knowledge of Reality should be based on sense experience. All valid statements must have an empirical basis, otherwise they are meaningless. Logical positivists were antagonist to the use of metaphysics in science. However, mechanical philosophy of nature seems to be an internally inconsistent, experientially unrealistic and philosophically unreflective approach to Reality. Einstein² had a dig at mathematical approach to Reality : "As for as the laws of mathematics refer to Reality, they are not certain; as far as they are certain, they do not refer to Reality."

Newtonian mechanics was extremely successful in the

growth of technology. For the general public, science became a worldly "Almighty". Modern technological "explosion" has blindfolded our inner realms. Society and culture necessitates a new vision of holistic Reality which can bring in a humanisation of science. Scientific descriptions of the enigma of Reality may cause a re-mystification of our universe.

Einstein realized a new vision of the universe. His theory of relativity has altered the long-held scientific assumptions of Newtonian mechanics and changed radically the way we look at the world. Relativity shows that our knowledge of Reality is not limited by sense perception only, but brings home to us that Reality is often much deeper than what can be perceived by our senses. Materialism which refuses to go beyond what is observable by the senses has been shown to be an inadequate philosophy of nature.

Quantum Nature of Reality: The Copenhagen interpretation³ of quantum mechanics was the first and the most prevalent response to the quantum Reality question. Neils Bohr and Werner Heisenberg were the founding fathers of Copenhagen interpretation which was not acceptable to Einstein, the father of Relativity theory. The key idea in the Copenhagen denial of deep Reality was that the quantum entities did not have dynamic attributes of their own; it was only in the act of measurement that they received dynamic attributes. Principles of Uncertainty and Complementarity were the corner stones of Copenhagen interpretation, proposed by Heisenberg and Bohr, respectively.

The discovery of Uncertainty principle is the most significant development in the history of science. It puts a natural limit to the precision attainable in the quantum world. It must be noted that this limitation is imposed not by practical difficulties of measurement but by theoretical considerations, by the very nature of Reality itself. There will always be a finite inaccuracy and uncertainty; this is a law of nature. Since precise knowledge of the present state of affairs of a phenomenon is not possible, precise prediction of its behaviour also becomes impossible. Hence the quantum world and its Reality are indeterminate.

Principle of Complementarity highlights the linkage between different aspects of Reality. For instance, the particle nature and wave nature of light are mutually exclusive in the sense that the presence of one excludes that of the other. Thus this principle argues that even items which appear incompatible are united at a deeper level. What appear opposites need not be contradictory, but may be two poles of the same deeper reality. The principles of Complementarity and Uncertainty show the unbreakable link between the act of observation and our picture of Reality. Bohr sums up his outlook on quantum Reality.⁴ "There is no quantum world. There is only an abstract quantum physical description. The task of physics is not to find out how nature is; Physics concerns what we can say about nature." In the Copenhagen interpretation, there is no Reality in the absence of observation, or in the other words, observation creates Reality. The conceptual weakness of the Copenhagen interpretation is that it regards both the measuring device and the measurement act as ultimately unanalysable.

Consciousness and Quantum Reality: David Bohm⁵ explains the limitation of Copenhagen interpretation by introduction of a new concept: the implicate order. The implicate order is a process of enfoldment and unfoldment in a multi-dimensional space. The entire universe with all its fields and particles is an unfoldment of this implicate order. It implies an organic vision of the universe unlike the classical emphasis on fragmentation.

Another important aspect of the quantum revolution is that it highlights the role of consciousness in creating Reality. According to Eugene Wigner⁶: "It is not possible to formulate the laws of quantum mechanics in a fully consistent way without reference to the consciousness. It will remain remarkable that the very study of the external world led to the conclusion that the content of the consciousness is an ultimate Reality."

John Stewart Bell⁷ developed a model of Reality known as Bell's theorem: Reality must be non-local, which means that at a fundamental level, the different isolated objects of our experience are connected in an intimate and immediate way. Where quantum physics revealed the inadequacy of our

common sense ideas to deal with the microscopic world, Bell's theorem showed the inadequacy of the same to deal with the macroscopic phenomena.

EPR (Einstein, Podolsky and Rosen) Paradox aims to show that quantum theory was incomplete since it fails to give a full description of nature. The key idea of EPR is the assumption of locality or the principle of local causes. According to this principle, what happens in one place is in no way dependent on an experimenter or an event at another place, where the distance between the two places are 'space-like' separated. EPR effect seems to indicate a super-luminal (faster than light) communication.⁸

Bell's theorem resolves the contradictions of EPR Paradox. Bell stated that either the statistical predictions of quantum mechanics or the principle of local causes must be wrong. Experimental proof of Bell's theorem established that assumption of locality collapses while statistical assumptions on which Bell based his theorem are correct. To show that the principle of locality is false, it should be shown that what happens in one area is dependent on the changes that an experimenter makes in a distant space-like separated area. Thus in Bell's theorem, non-locality imposes itself as a fundamental Reality against our common sense idea of the world as consisting of different parts.

Einstein believed that quantum theory was incomplete and hence inadequate to describe the nature of Reality. As a whole, there seems to be contradictions, logical paradoxes and speculative jumps inherent in quantum theory in explaining the physical Reality. Bell⁹ and some of his supporters share the view that the quantum mechanical description of natural phenomena will be superseded in future. Each model of Reality of the physicists is thus also indicative of the unexplored regions of Reality. Concept of Reality has undergone a sea change since the times of Aristotle. Let us probe the metaphysical and mystical roots of Reality and explore the possibilities of a dialogue between Science and Religion.

Metaphysical Nature of Reality

Metaphysics is a systematic and sustained inquiry into the

nature of ultimate reality. It is an attempt to know the reality as against mere appearance. Metaphysics is the bridge between science and religion. Religion relies both on reason and revelation in its attempt to study the nature of Reality. In the *Māṇḍūkya Upanishad*, the method of inquiry into the states of experiencing, waking, dreaming and deep sleep is frequently adopted.

To the Indian philosopher, experience is the ultimate test of truth.¹⁰ Since the reality is trans-empirical, it cannot be known through sense experience in the way in which empirical objects are known. It is known through intuitive experience (*anubhūti*), it is the experience of the highest level, for it transcends both the rational and the sensory aspects of human experience with which we are normally acquainted.

Since the ultimate reality is trans-empirical, the Hindu philosophers rely on scripture (*śruti*) for obtaining the knowledge of the real. Discursive reasoning functions at the relational level. Since the ultimate reality is distinction-less, reason is not competent to comprehend it. So the proper ground of rational knowledge is immediate experience, which differs from experimentation in science.

The truth, which the scripture speaks about, is the direct outcome of the intuitive or mystic experience of the ancient seers. It contains what is borne out by their direct and authentic experience. Though the scripture is authoritative, the knowledge which one derives from it is only mediate. The knowledge, which is revealed by the scripture, must become a matter of experience; only then revelation would have fulfilled its mission. A man who has realised the integral experience, there is no need for him to depend on any external authority in the form of a scripture. His wisdom is self-certifying or self-revealed.

According to *Upanishads*, *Brahm* or *Atma*, which is the ultimate Reality, is of the nature of existence (*sat*), consciousness (*chit*), and bliss (*ānanda*). It is one only and non-dual. The pluralistic universe is only an illusory appearance of *Brahm* or *Atma* due to *Māyā* or *avidyā* (ignorance). There are two views of reality in the *Upanishads*, the cosmic view and the acosmic

view. These two views serve as the bases for the theistic and absolutistic schools of Vedanta. Hindu Philosophy of Vedanta considers this word as *Māyā* (illusion) and lays stress on Reality beyond appearance in phenomenal world.

Mystical Vision of Reality

In contrast to scientific knowledge, mysticism is concerned with a direct experience of Reality. It is by transcending intellectual knowledge and sensory perception that we come to the "absolute knowledge" of the Reality. According to Fritzof Capra¹¹: "The knowledge of Reality in mysticism is the direct experience of undifferentiated, undivided, indeterminate 'suchness'. In mysticism knowledge of the ultimate Reality cannot be attained through reasoning because it transcends our conventional modes of language."

The process of scientific research tells us that an experimental enquiry into the nature of Reality cannot discard either reason or intuition. Since both these abilities are integrated in the one human being, a mutual complementarity of the two is essential. The significance of intuition and reason is quite evident in our life and they must complement each other in our search of Reality. There cannot exist a rebellion between truth and truth. The pragmatism of the Copenhagen interpretation of quantum theory indirectly affirms the desperate quest for integration. As Gary Zukov¹² puts it: "The rational part of our psyche, typified by science, began to merge again with that other part of us which we had ignored since the 1700's, our irrational side."

Modern science has come up with the most exciting discovery of the interconnectedness of the universe. The vastness of the Universe poses no threat to its interconnectedness. This phenomenon is found both at the local and cosmic levels, both on the ontological and epistemological levels. This progressive trend towards greater unification enabled science to transcend the apparent contradictions of several pairs of opposites, e.g., force and matter, particles and waves, motion and rest, existence and non-existence. The scientific research has established interconnectedness of all material beings

tracing their common origin to quarks and leptons. The Human Genome Project has proved the unity in diversity of the living world.

Capra¹³ has established parallels between the principal theories of modern physics and the mystical traditions of the East, viz., Hinduism, Buddhism and Taoism. For example, we have no direct sensory experience of the four-dimensional space-time continuum, and whenever this 'relativistic' reality manifests itself we find it very hard to deal with it at the level of intuition and ordinary language. A similar situation exists in Eastern mysticism. The mystics seem to be able to attain non-ordinary states of consciousness in which they transcend the three-dimensional world of everyday life to experience a multi-dimensional reality, which is impossible to describe in ordinary language.

Opposed to the mechanistic conception of the world is the view of the Eastern mystics¹⁴ which may be characterized by the word 'organic', as it regards all phenomena in the universe as integral parts of an inseparable harmonious whole. For the Eastern mystic, all things and events perceived by the senses are interrelated, connected, and are but different aspects or manifestations of the same ultimate Reality. Our tendency to divide the world we perceive into individual and separate 'things' and to experience ourselves in this world as isolated egos is seen as an 'illusion' which comes from our measuring and categorizing mentality. The division of nature into separate objects is, of course, useful and necessary to cope with everyday environment, but it is not a fundamental feature of Reality. For the Eastern mystic, any such objects have, therefore, a fluid and ever-changing character.

The Eastern worldview is thus intrinsically dynamic, and contains time and change as essential features. The cosmos is seen as one inseparable Reality forever in motion, alive, organic – spiritual and material at the same time.

Mysticism is the art of union with Reality.¹⁵ A mystical state has the quality of ineffability. It thus resembles a state of feeling rather than a state of intellect. The mystic experience is imbued with a noetic quality, a quality of transience and of timelessness.

There are many stages of evolution in the life of a mystic. Ultimately, the mystic attains the perfect union with God and he cries: 'I am God – *aham brahm asmi*'. It is a well known fact that mystics feel that exalted state of ecstasy but fail to describe it in ordinary language. The mystics use the simile of a dumb person who cannot describe the taste of candy. Saith Kabir¹⁶ :

ਕਹੁ ਕਬੀਰ ਗੁੰਗੈ ਗੁੜ ਖਾਇਆ ਪੁਛੇ ਤੇ ਕਿਆ ਕਹੀਐ ॥

Such state is like the dumb tasting of sugar, which in no way can be described.

Mystics believe in the integral or holistic experience of Reality. We need not rest content with the partial truths revealed by astronomy, by physics, by biology, by history; each true in its own field, none complete in itself, none giving the whole picture; nor yet with the truth of mathematics or the truth of language, primarily truths of expression, obeying rules which men themselves have made. Beyond all these, beyond the contradictions of each separate truth, lies concealed the supreme and final truth.

The realm of mystic experience is a Reality beyond the comprehension of our senses. But there is clear evidence in SGG¹⁷ regarding the transcendental nature of this phenomenon:

ਅਖੀ ਬਾਝਹੁ ਵੇਖਣਾ ਵਿਣੁ ਕੰਨਾ ਸੁਨਣਾ ॥
ਪੈਰਾ ਬਾਝਹੁ ਚਲਣਾ ਵਿਣੁ ਹਥਾ ਕਰਣਾ ॥
ਜੀਭੈ ਬਾਝਹੁ ਬੋਲਣਾ ਇਉ ਜੀਵਤ ਮਰਣਾ ॥
ਨਾਨਕ ਹੁਕਮੁ ਪਛਾਣਿ ਕੈ ਤਉ ਖਸਮੈ ਮਿਲਣਾ ॥

In this realm, one sees but without the eyes; one listens but without the ears;

One walks but without the feet; one works but without the hands;

One speaks but without the tongue; thus attaining life in death.

O Nanak, one meets the God after realisation of the divine law.

Concept of Reality in Sri Guru Granth Sahib (SGGS)

The concept of ultimate reality propounded by Guru Nanak in the SGG¹⁸ is most scientific; as a consequence, it is

also dynamic and precise. The *Maṅglācharaṇ* (the Commencing Verse of *SGGS*) is a philosophic testimony of Guru Nanak's poetic and scientific vision of the Supreme Reality.¹⁸ Reality is one and non-dual. Hence the *Maṅglācharaṇ*¹⁹ commences with the numeral 1 before 'Open Oorā', which represents Existence or Being. It is followed by *Satt(i) Nām* which means the Supreme Reality is true and it is manifested in Truth, Existence and Being. The other features of Reality are its transcendence and immanence, creator person, without fear or hatred, beyond time and space, self-existent, transcendental cosmic spirit made manifest by grace of the Guru.

ੴ ਸਤਿ ਨਾਮੁ ਕਰਤਾ ਪੁਰਖੁ ਨਿਰਭਉ ਨਿਰਵੈਰੁ ਅਕਾਲ ਮੂਰਤਿ ਅਜੂਨੀ ਸੈਭੰ
ਗੁਰ ਪ੍ਰਸਾਦਿ॥

Thus Guru Nanak projects the nature, potentialities and characteristics of Supreme Reality or God of his vision. This concept of Reality is unique, scientific and revolutionary and it differs in its connotation from the Vedantic concept. According to Ahluwalia²⁰: "This new conception of God marks a qualitative change in the cognition of the Ultimate Reality from Being to Spirit. This evolutionary change, heralded by the Sikh metaphysics in the history of the Indian religious thought, leads to a new conception of time."

The very first *sloka*²¹ after *Maṅglācharaṇ* elaborates further the nature of Ultimate Reality. Reality or God was in existence before the commencement of creation and time (*yugas*) during the epoch of cosmic void. God existed at the beginning of this universe, i.e., creation of space and time. God exists now and will also exist in the future (even when the universe is annihilated):

ਆਦਿ ਸਚੁ ਜੁਗਾਦਿ ਸਚੁ ॥ ਹੈ ਭੀ ਸਚੁ ਨਾਨਕ ਹੋਸੀ ਭੀ ਸਚੁ ॥

The Sikh philosophy dialectically unites the ideas of God and the world. Transcendence shows that God is prior to and distinct from the world. Immanence of God represents God's connection with the world. God himself transforms into creation, i.e., changing His *nirguṇa* form into *sarguṇa* form²²:

ਸਰਗੁਨ ਨਿਰਗੁਨ ਨਿਰੋਕਾਰੁ ਸੁੰਨ ਸਮਾਧੀ ਆਪਿ ॥
ਆਪਨ ਕੀਆ ਨਾਨਕਾ ਆਪੇ ਹੀ ਫਿਰਿ ਜਾਪਿ ॥

The Formless is attributed and un-attributed;
And gone into absorption in the cosmic void.
Saith Nanak: He has made creation,
Himself on it meditates.

The *Maṅglācharaṇ* in the *SGGS* is an expression of Guru Nanak's intuitive insight into the metaphysical realm, which presents an integrated view of the basic Reality that is monistic, but whose manifestation is pluralistic²³:

ਨਿਰੰਕਾਰ ਆਕਾਰ ਅਪਿ ਨਿਰਗੁਨ ਸਰਗੁਨ ਏਕ ॥
ਏਕਹਿ ਏਕ ਬਖਾਨੋ ਨਾਨਕ ਏਕ ਅਨੇਕ ॥

The conceptual framework of the *Maṅglācharaṇ* is comprehensive enough to include some of the most significant attributes of the Absolute (Supreme Reality). Even the manifest aspect of Reality, namely, the physical universe, defies measure and count. Perhaps, God alone can contemplate the vastness and totality of the cosmic existence²⁴:

ਅੰਤੁ ਨ ਜਾਪੈ ਕੀਤਾ ਆਕਾਰੁ ॥ ਅੰਤੁ ਨ ਜਾਪੈ ਪਾਰਾਵਾਰੁ ॥

Limitless the creation; Limitless the expansion.

The Guru assures us that the light and grace of the Absolute are ever with man in his search for Supreme Reality. A person of cosmic consciousness (*brahm gyānī*) can experience Reality and all his doubts are dispelled²⁵:

ਜਾ ਕੈ ਰਿਦੈ ਬਿਸਾਸੁ ਪ੍ਰਭੁ ਆਇਆ ॥
ਤਤੁ ਗਿਆਨੁ ਤਿਸੁ ਮਨਿ ਪ੍ਰਗਟਾਇਆ ॥

He, who receives faith of Lord in himself,
His mind is illumined by the Reality of the Real.

Ultimate Reality is subtle and incomprehensible but can be realised through Guru's *sabda* unconsciously²⁶:

ਹਰਿ ਜੀ ਸੁਖਮੁ ਅਗਮੁ ਹੈ ਕਿਤੁ ਬਿਧਿ ਮਿਲਿਆ ਜਾਇ ॥
ਗੁਰ ਕੈ ਸਬਦਿ ਭ੍ਰਮੁ ਕਟੀਐ ਅਚਿਤੁ ਵਸੈ ਮਨਿ ਆਇ ॥

The Lord is the subtle, unfathomable entity;
So how is one to attain Him?
It is through Guru's Word that our doubt is dispelled
And the self-dependent Being cometh into our minds.

Guru Nanak has combined the symbol *Satt* with *Nām*, which literally means 'Name'. When we refer to the world of

names and forms, we refer to the concrete, empirical universe, which we know in our ordinary experience and discover through the agency of science. In short *Nām* is Truth, or the knowable aspect of Reality. *Nām* is immanent in the universe and its practice is the only formula prescribed by the Sikh Gurus to realize God. In fact, whatever is created is *Nām*²⁷:

ਜੇਤਾ ਕੀਤਾ ਤੇਤਾ ਨਾਉ ॥ ਵਿਣੁ ਨਾਵੈ ਨਾਹੀ ਕੋ ਥਾਉ ॥

All that is created is His manifestation

Guru Nanak was always antipathetic to any view of the world, which denigrated its reality or made the world illusory. He was, therefore, firm on the principle that the creation is as real as the creator—it includes, besides material existence, the culture of man, his thoughts and his values. Guru Nanak discards the Vedantic conception of Reality in *Āsā-dī-Vār*, and proclaims that this universe is real, not an illusion²⁸:

ਸਚੇ ਤੇਰੇ ਖੰਡ ਸਚੇ ਬ੍ਰਹਮੰਡ ॥ ਸਚੇ ਤੇਰੇ ਲੋਅ ਸਚੇ ਆਕਾਰ ॥

Real are Thy continents; Real is the universe;

Real are these forms and material objects;

Thy doings are Real, O Lord.

The Guru calls this vast universe as His mansion²⁹:

ਇਹੁ ਜਗੁ ਸਚੈ ਕੀ ਹੈ ਕੋਠੜੀ ਸਚੇ ਕਾ ਵਿਚਿ ਵਾਸੁ ॥

This moving universe is the divine mansion of the True Lord; and the True One lives therein.

Guru Nanak has identified the manifest Reality with Nature³⁰ and the term used in *SGGS* to denote it is *qudrat*:

ਨਾਨਕ ਸਚ ਦਾਤਾਰੁ ਸਿਨਾਖਤੁ ਕੁਦਰਤੀ ॥

Nanak, the beneficent Lord alone is true and

He is revealed through His Nature.

God transformed Himself from *nirguṇa* to *sarguṇa*, created *Nām* and *Qudrat*, i.e.; Nature³¹:

ਆਪੀਨੈ ਆਪੁ ਸਾਜਿਓ ਆਪੀਨੈ ਰਚਿਓ ਨਾਉ ॥

ਦੁਯੀ ਕੁਦਰਤਿ ਸਾਜੀਐ ਕਰਿ ਆਸਣੁ ਡਿਠੋ ਚਾਉ ॥

His-self He created and manifested His Name;

And then He created Nature and abiding within it,

He revelled in His wonder.

The description of Nature³² by Guru Nanak in *Āsā-dī-Vār* is a new dimension in the history of religious thought:

ਕੁਦਰਤਿ ਦਿਸੈ ਕੁਦਰਤਿ ਸੁਣੀਐ ਕੁਦਰਤਿ ਭਉ ਸੁਖ ਸਾਭੁ ॥

ਕੁਦਰਤਿ ਪਾਤਾਲੀ ਆਕਾਸੀ ਕੁਦਰਤਿ ਸਰਬ ਆਕਾਰ ॥

All that is visible is His Nature;

All that is heard too is His Nature...

In the nether regions and skies

is the manifestation of His Nature;

Of His Nature are all the manifestations.

To sum up, the concept of Supreme Reality as presented in *SGGS* is unique, scientific and revolutionary. In a way, scientific study of Nature is sanctioned in Sikh religion in an identical manner as it was pursued by Kepler and Newton in the Christian world. It is not a mere abstraction. Its realization is possible through the practice of *Sabda* and *Nām*. Guru Nanak was blessed with the vision of God or Reality in Nature³³:

ਸਾਂਤਿ ਪਾਵਹਿ ਰੋਵਹਿ ਮਨ ਸੀਤਲ ਅਗਨਿ ਨ ਅੰਤਰਿ ਧੁਖੀ ॥

ਗੁਰ ਨਾਨਕ ਕਉ ਪ੍ਰਭੁ ਦਿਖਾਇਆ ਜਲਿ ਬਲਿ ਤ੍ਰਿਭਵਣਿ ਰੁਖੀ ॥

You shall find peace, and your mind shall be soothed;

The fire of desire shall not burn within you.

The Guru hath revealed the Lord's presence to Nanak in the three worlds;

In the woods, waters and over the earth.

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Concept of *Sīnya* (*Sīnn*) in *Sri Guru Granth Sahib*

Introduction

The holy scripture of the Sikh faith, called *Sri Guru Granth Sahib* (SGGS), consists of hymns of devotion to God, inspired reflections on the cosmic order, the vision of the higher life and exhortation to man towards lifting himself to the state of spiritual peace and the attainment of liberation. During twenty-first century, a dialogue between Science and Religion is the order of the day for ushering in world peace. SGGS with its universal doctrines based on truth, compassion and justice is destined to play a sterling role at the global level. According to my personal view based on the study of Holy Scriptures of almost all major religions of the world, perhaps, this is the only scripture which corroborates modern scientific theories in the domain of cosmology.

Big-Bang cosmology explains many features of our universe and it holds its sway due to experimental support it got during the recent years. However, it has many enigmas yet to be resolved. For example, who created the universe? What was the pre-creation state of the universe? What will be the end or fate of the universe? Mathematical models fail to answer these questions. In fact, all mathematical equations fail at the moment of creation of the Universe and its annihilation leading us to "Singularities", a term which has become a cosmological buzzword these days.

SGGS comes to the rescue of our modern day cosmologists.

A wonderful doctrine of *Sūnn* is introduced in the Sikh scripture to explain the pre-creation state of the universe. God is the creator of the universe and He is the annihilator. So there is no enigma or the need for the concept of 'Singularity' in SGGs.

Surprisingly, Quantum Physics allows the universe to appear out of nothing at all, as a so-called vacuum fluctuation using the famous 'Uncertainty Principle'. Chaotic inflation led to the sudden expansion of the Universe out of a quantum fluctuation. Indian religious literature is full of references regarding creation of the Universe. However, the doctrine of *Sūnya*, first introduced in Buddhism has been elaborated in SGGs. It is a testimony of intuitive knowledge gained by the Sikh Gurus using *dib-drishti* or spiritual vision which is of transcendental nature.

Concept of *Sūnya* in Indian Tradition

Sūnyam and *Sūnyatā* are two terms of major importance in Buddhism and have been used to denote 'emptiness', 'nothingness', 'non-substantiality' and 'the inexhaustible'. During the second century BC, Buddhist teachers in India emphasized the 'emptiness' as a basic description of the nature of existing things. They were known as 'teachers of emptiness' or *sūnyavādins*. The emptiness of all things is a significant part of the Bodhisattva path to enlightenment in Mahayana Buddhism.

Nagarjuna, the greatest Buddhist philosopher, interprets *Sūnyatā* in his treatise, *Madhyāmika Sūtras*.¹ He established the theory of *Sūnyatā* and accepted it as the fundamental principle underlying creation. The doctrine of the void is a method of rejecting all attachments because things have no 'self', that is, they are empty. 'Void' is not nothingness conceived in negative terms. This positive concept of 'void' is often compared with emptiness inside a vase. The state of *Sūnyatā*, or void is one in which all polarity, all subject-object differentiation has ceased to exist. But for a *sūnyavādin* this is a positive concept. *Sūnyatā* is the negation of all views and is itself not a view!

In Siddh-Nath-Yogi tradition,² the term *sūnya* has been used frequently. It is said that *sūnya* is so transcendental that it is neither in the body nor is it out of the body. *Sūnya* has

been linked with the *sabda* or *nāda*. In the *Hathyogic* and *Tāntrik* cults, *Nāda* or *Sabda Brahm* had been accepted as the original cause of the cosmos. In the Siddh-Natha cult, *siinya* was considered as a synonym of *Sabda* or the absolute *Nāda*, which is nothing but a trait of Absolute Reality. In Gorakh Bānī, there is a mention of one *siinyadvārā* in the *gaganmaṇḍal* where in complete darkness, lightning flashes and the nectar trickles. The Siddha attains this stage by yoga practices. In the Siddh-Natha literature, the word *siinya* has been used in the following contexts:

- a) Supreme Reality (*Nāda*), Supreme knowledge or Supreme nature.
- b) *Brahmanrandhra*, *Dasam dwāra*, the *Sahsra chakra* and *Gaganmaṇḍal*.
- c) *Siva-loka*.

Concept of *Siinya* (*Sünn*) in Sikh Tradition

We find an echo of *Siinyatā* philosophy of Buddhism in Sikh scripture,³ *Sri Guru Granth Sahib* (SGGS). Siddh-Nath-Yogis held their sway in Punjab before the advent of Sikhism. They all belong to the Sahajayani sect of Buddhism or its perverted forms after assimilation into Hindu fold. According to *Mahān Kosh*, there were twelve *panths* of Nath cult in Punjab and eighty-four Siddhas, with Guru Gorakh Nath as a leading figure among the Siddhas of Punjab. Guru Nanak's dialogue with Siddhas is recorded in SGGS as *Siddh-Goshti* which is in the form of a religious debate concerning origin of cosmos, *siinya*, liberation and various other issues. Guru Nanak rejected the Hatha-Yoga cult of Siddhas and condemned the path of renunciation of the world followed by them. He advocated adoption of house-holder's life in this world and preached Sahaj-Yoga or Nām-Yoga, the Sikh way of life.

The term *Siinya* occurs in *Siddh-Goshti*⁴ when Siddhas pose a question to Guru Nanak about the primordial state of the universe:

ਅਹਿ ਕਉ ਕਵਨੁ ਬੀਚਾਰੁ ਕਬੀਅਲੇ ਸੁੰਨ ਕਹਾ ਘਰ ਵਾਸੈ ॥

What about the pre-cosmos state?

Prior to it where the Lord of void abide?

Guru Nanak answers their query in his characteristic style that this state is beyond description:

ਅਹਿੰਦ ਕਉ ਬਿਸਮਾਦੁ ਬੀਚਾਰੁ ਕਬੀਅਲੇ ਸੁੰਨ ਨਿਰੰਤਰਿ ਵਾਸੁ ਲੀਅਾ ॥

The very thought of the pre-cosmos state lands one in a state of wonder. In the profound stillness of the *Sūnya*, the formless one pervaded in continuum then.

Siddh-Goshti in *SGGS* is a remarkable debate on the beliefs, practices and doctrines of the two systems; one propounded by the Siddhas and the other by Guru Nanak, the founder of Sikh faith. Philosophical questions concerning the origin of cosmos, life and mind, potency of *Sabda*, need for the Guru, nature of Supreme Reality and the liberation for human soul are answered by Guru Nanak from the Sikh view-point. The concept of Ideal Man (*Gurmukh*) is propounded by Guru Nanak demolishing the concept of world renunciation practiced by Siddhas.

Interpretations of *Sūnya* Doctrine in *SGGS*

Various interpretations of *Sūnya* doctrine exist in *SGGS*. We have an echo of Buddhist philosophy in the Sikh scripture. *Sūnya* is not equated with void or emptiness in *SGGS*. Rather, it represents the state of equipoise where Absolute Lord exists in primordial trance called *sūnya samādhi*⁵:

ਸੁੰਨ ਮੰਡਲ ਇਕੁ ਜੋਗੀ ਬੈਸੇ ॥

The Yogi, the Primal Lord, sat within the celestial sphere of deepest trance (*samādhi*).

In *SGGS*, Absolute Reality or God is both immanent and transcendent.⁶ It is formless, attributeless and hence beyond description:

ਸਰਗੁਨ ਨਿਰਗੁਨ ਨਿਰੰਕਾਰ ਸੁੰਨ ਸਮਾਧੀ ਅਪਿ ॥

He possesses all qualities, He transcends all qualities; He is the formless Lord; He Himself is in Primal trance (*samādhi*).

In consonance with the Buddhist philosophy of *sūnyatā*, subject-object differentiation or concept of duality does not exist in the *sūnya* state as enunciated by saint Kabir⁷ in *SGGS*:

ਜੀਵਨ ਮਿਰਤੁ ਨ ਦੁਖੁ ਸੁਖੁ ਬਿਆਪੈ ਸੁੰਨ ਸਮਾਧਿ ਦੋਊ ਤਹ ਨਾਹੀ ॥

No life or death, no pain or pleasure is felt there.
There is only the primal trance of *samādhi*, and hence no duality.

Absolute Reality or God is omnipresent and exists in the present, past and future. The truth of primordial existence of God before the creation of time and space is also explained by Guru Nanak in *SGGS*⁸:

ਅਹਿ ਸਚੁ ਜੁਗਾਦਿ ਸਚੁ ॥ ਹੈ ਭੀ ਸਚੁ ਨਾਨਕ ਹੋਸੀ ਭੀ ਸਚੁ ॥੧॥

Existed before the beginning of time and space;
Existed throughout the various ages in the past;
Exists in the present; and
Will exist in the future.

There is also an echo of Siddha doctrine⁹⁻¹⁰ of *siinya* in the form of *Nāda* in *SGGS* :

ਸੁੰਨ ਸਮਾਧਿ ਅਨਹਤ ਤਹ ਨਾਦ ॥

The deepest *samādhi*, and the unstruck sound current of the *Nāda* is there.

ਤਹ ਅਨਹਤ ਸੁੰਨ ਵਜਾਵਹਿ ਝੂਰੇ ॥

There, the unstruck sound current of the Absolute Lord vibrates and resounds.

Sūnya Phase and Creation of Universe in *SGGS*

The most original contribution of Sikh scripture is in the field of cosmology. Before the creation of the universe, Absolute Reality or God existed in the *Sūnya* phase, called *ād(i) sach* by Guru Nanak. When the creation starts, both time and space are also created and this phase corresponds to *jugād(i) sach*. In *Mārū Solhe* composition in *SGGS*, the process of creation is explained in a scientific manner corresponding to Big-Bang cosmology. The primordial state of existence of God or *ād(i) sach* is synonymous with the *Sūnya* phase as epitomised in *SGGS*¹¹:

ਅਰਬਦ ਨਰਬਦ ਧੰਧੁਕਾਰਾ ॥ ਧਰਟਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ ॥

ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ ॥

Billions of years ago,
There was nothing but utter darkness,

There was neither earth nor sky,
And the Will of God prevailed.
There was neither day nor night, nor moon nor Sun;
God sat in primal, profound trance (in *Sūnya*).

Guru Arjun, the fifth Nanak, describes the primordial trance of God before the creation process starts as a manifestation of God¹²:

ਕੇਤੜਿਆ ਦਿਨ ਗੁਪਤੁ ਕਹਾਇਆ ॥
ਕੇਤੜਿਆ ਦਿਨ ਸੁੰਨਿ ਸਮਾਇਆ ॥
ਕੇਤੜਿਆ ਦਿਨ ਧੁੰਧੁਕਾਰਾ ਅਪੇ ਕਰਤਾ ਪਰਗਟੜਾ ॥

For countless days, He remained invisible.
For countless days, He remained absorbed in *Sūnya*
For countless days, there was utter darkness, and
Then the Creator revealed Himself.

According to Guru Arjun,¹³ there was no duality in the *Sūnya* phase of existence of God as already discussed under the Indian tradition of Buddhist philosophy:

ਜਬ ਅਕਾਰੁ ਇਹੁ ਕਛੁ ਨ ਦ੍ਰਿਸਟੇਤਾ ॥
ਪਾਪੁ ਪੁੰਨ ਤਬ ਕਹ ਤੇ ਹੋਤਾ ॥
ਜਬ ਧਾਰੀ ਆਪਨ ਸੁੰਨ ਸਮਾਧਿ ॥
ਤਬ ਬੈਰ ਬਿਰੋਧ ਕਿਸੁ ਜੰਗਿ ਕਮਾਇ ॥
ਜਬ ਇਸ ਕਾ ਬਰਨੁ ਚਿਹਨੁ ਨ ਜਾਪਤ ॥
ਤਬ ਹਰਖ ਸੋਗ ਕਹੁ ਕਿਸਹਿ ਬਿਆਪਤ ॥
ਜਬ ਆਪਨ ਆਪ ਆਪਿ ਪਾਰਬ੍ਰਹਮ ॥
ਤਬ ਮੋਹ ਕਹਾ ਕਿਸੁ ਹੋਵਤ ਭਰਮ ॥

When there was no creation,
Whence was the need for virtue and vice?
When the God was in Primordial trance (*Sūnya samādhi*),
Whence was the need for enmity or jealousy?
When God was not in Its manifested form,
Thence who could suffer pain or feel happy?
When God was in Its transcendental Entity,
Thence who was lured by attachment or by doubt?

However, the most beautiful elaboration of *Sūnya* doctrine¹⁴ is given by Guru Nanak in his composition *Maru Solhe* in *SGGS* (Appendix I). *Sūnya* is compared to a primal void where God

exists in its full effulgence. The creation appears when God wills out of this *sūnya* phase. All the seventeen stanzas of seventeenth *Solhe* give us a vivid description of *sūnya* and there is no parallel in Indian religious literature to the spiritual vision of Guru Nanak. We may quote only a few reflections from this vision:

ਸੁੰਨ ਕਲਾ ਅਪਰੰਪਰਿ ਧਾਰੀ ॥ ਆਪਿ ਨਿਰਾਲਮੁ ਅਪਰ ਅਪਾਰੀ ॥
 ਅਧੇ ਕੁਦਰਤਿ ਕਰਿ ਕਰਿ ਦੇਖੈ ਸੁੰਨਹੁ ਸੁੰਨੁ ਉਪਾਇਦਾ ॥੧॥
 ਪਉਣੁ ਪਾਣੀ ਸੁੰਨੈ ਤੇ ਸਾਜੇ ॥ ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ ॥
 ਅਗਨਿ ਪਾਣੀ ਜੀਉ ਜੋਤਿ ਤੁਮਾਰੀ ਸੁੰਨੇ ਕਲਾ ਰਹਾਇਦਾ ॥੨॥...
 ਸੁੰਨਹੁ ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸ਼ੁ ਉਪਾਏ ॥...
 ਸੁੰਨਹੁ ਚੰਦੁ ਸੂਰਜੁ ਗੈਣਾਏ ॥ ਤਿਸ ਕੀ ਜੋਤਿ ਤ੍ਰਿਭਵਣ ਸਾਰੇ ॥...
 ਪੰਚ ਤਤੁ ਸੁੰਨਹੁ ਪਰਗਾਸਾ ॥...
 ਸਤਿਗੁਰ ਤੇ ਪਾਏ ਵੀਚਾਰਾ ॥ ਸੁੰਨ ਸਮਾਧਿ ਸਚੇ ਘਰ ਬਾਰਾ ॥
 ਨਾਨਕ ਨਿਰਮਲ ਨਾਦੁ ਸਬਦੁ ਧੁਨਿ ਸਬੁ ਰਾਮੈ ਨਾਮਿ ਸਮਾਇਦਾ ॥੧੭॥

In the *Sūnya* (Primal void), the infinite Lord assumed his Power.

He Himself is unattached, infinite and incomparable.

From the *Sūnya*, He created air and water.

He created universe and the man in the fortress of body.

From this *Sūnya*, Brahma, Vishnu and Shiva issued forth.

From this *Sūnya*, the moon, the sun and the earth were created.

They were created from *Sūnya*, and they will merge into the *Sūnya*.

From the *Sūnya*, the five elements became manifest.

From the True Guru, contemplative meditation is obtained.

And then, one dwells with the True Lord

In His celestial home, in deepest *samādhi* of *Sūnya*.

O Nanak, the immaculate sound current of the *Nāda*

And the music of the *Sabda*, resound;

One merges into the True Name of the Lord.

Conclusion

The concept of *Sūnya* as introduced by Guru Nanak in SGGS has far reaching implications for understanding the

Nanakian philosophy of Sikhism.¹⁵ Apparently, the concept has theoretical linkage with Indian philosophy as it developed during the Buddhist era. Guru Nanak re-interpreted it and hence its import in Sikh metaphysics.

When Siddhas ask Guru Nanak: "Who are they, who are attuned to this Absolute *Sūnya*?" Guru Nanak answers: "They are the *Gurmukhs* (Guru-oriented), like the God, from whom they originated." While *Sūnya* doctrine was used to promote renunciation and monasticism by its Buddhist advocates known as *sūnyavādins*, Guru Nanak condemned it and advocated the life-style of a *Gurmukh*, the house-holder who faces the challenges of worldly life. Thus theoretical implications of *Sūnya* doctrine may be identical in both Buddhism and Sikhism but empirical meanings are different in the two systems. In the Sikh metaphysics, *Sūnya* represents the pre-creation stage of our cosmos when God or Absolute Reality was absorbed in Itself and realm of duality was non-existent.

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Concept of Nature (*Qudrat*) in Science and *Sri Guru Granth Sahib*

The concept of nature has played a predominant role in science and religion since ancient times. Greek philosophers were aware of the role of nature and wrote about it in their philosophical treatises. In fact, before classification of science into different branches, the study of natural phenomenon was called natural science or natural philosophy. What do we mean by nature? To understand it, we have to discuss the philosophy of natural science or in other words, science of nature. But – What is nature?

According to A.N. Whitehead¹:

Nature is that which we observe in perception through the senses. In this sense perception we are aware of something which is not thought and which is self-contained for thought. This property of being self-contained for thought lies at the base of natural science. It means that nature can be thought of as a closed system whose mutual relations do not require the expression of the fact that they are thought about. Thus in a sense, nature is independent of thought.

Plato and Aristotle elaborated the Greek thought regarding the fundamental question: What is nature made of? The answer which their genius gave to this question, have determined the unquestioned nature as a process.

Plato asserts that nature is made of fire and earth with air and water as intermediate between them, so that 'as fire

is to air so is air to water, and as air is to water so is water to earth'. This is the origin of so-called four element theory of Greeks. Plato also suggests a molecular hypothesis for these four elements. Later on, ether was added as a fifth element. Earth, water, air, fire and ether are related in direct succession and form the ultimate substrata of nature. Matter, in its modern scientific sense, is a return to the Ionian effort to find in space and time some stuff which composes nature. Thus in Greek philosophy, the search for the ultimate entities and their relationship became the cornerstone for the study of nature. This search is the origin of science.

Greek science or natural philosophy held its sway for over two thousand years before it was superseded by experimental science formulated by Galileo and Newton. Concepts of space, time and matter were re-defined and mathematical relations were established through dynamical equations of motion. Modern era, from the beginning of the seventeenth century, has been dominated by a scientific technical world-view where man is regarded as the key player. The Newtonian world-view gave birth to a materialistic philosophy of nature. Laplace had laid down the foundations of mechanistic cosmology which exterminated God, whom Newton, a devout Christian, needed for correcting planetary motion irregularities to prevent collision between them. The Newtonian view of matter as inert substance struck roots in western thought and culture. Man and Nature were considered as cogs of a wheel in a machine-like world. The machine mindedness resulted in complete demoralization and depersonalization of the human being.²

The advent of relativity theory and quantum mechanics has brought revolutionary changes in the Newtonian worldview.³ Determinism, the philosophical doctrine that the universe is a vast machine operating on a strictly causal basis, is rejected. Space, Time, Matter and Motion find new meanings in the relativistic world-view. In classical physics space and time existed separately, in mutual isolation. Relativity theory obliterates this distinction between space and time, mass and energy, inertia and gravitation and leads to the unification of field and particle concepts of nature. Relativity theory and quantum mechanics have redefined our notions of physical

reality. The sharp boundaries that existed between space and time, mass and energy, fields and particles, subjects and objects, waves and particles, have disappeared and there appears interconnectedness between all parts of nature as a whole.

Concept of Nature in Sri Guru Granth Sahib

Guru Nanak, the founder of Sikh religion, was fully aware of the ancient Indian thought and its implications concerning nature. He had first hand knowledge of both Hindu and Muslim viewpoints about nature. Surprisingly, Guru Nanak opted for Arabic term *qudrat* for nature in comparison to Sanskrit term '*prakriti*' which occurs in Samkhya school of Indian philosophy.

The concept of *purusha* and *prakriti* is cornerstone of Indian philosophy. Broadly speaking, Samkhya dualism⁴ of *purusha* and *prakriti* may be compared with Cartesian dualism of subject and object which has dominated the western thought. Samkhya divides all things into two categories: (a) things which possess consciousness (*chetan*), (b) things which are unconscious (*jada*) are objects of consciousness. The totality of *jada* things is called *prakriti* (nature).

According to the Hindu view, matter is eternal and *purusha* (creator) has always been independent of God. It is the *purusha* who rules *prakriti* and creates the universe. The ultimate constituents of which *prakriti* is composed are *gunas* which are three in number; *sattva*, *rajas* and *tamas*. According to Kapur Singh,⁵ Guru Nanak has abandoned the term *prakriti* while retaining the term *purusha* in his description of nature, after noting the dualism of Hindu philosophy.

Why Guru Nanak was at pains to borrow a fundamental term (*qudrat*) of Sikh philosophy from a source, non Indo-Sanskrit? It would appear that main reasons were three⁵:

- (i) Primarily, Guru Nanak wanted a term of philosophy to which he could impart a connotation and meanings as would fit with the base of the religion that he revealed.
- (ii) Incidentally, Guru Nanak wanted to break the shell of prejudice enclosing the Hindu mind and attitudes towards modes of human communication other than

Indo-Sanskrit. There is a severe injunction in the *Bhavishyapurāṇa*⁶: "Even if the consequence is death, a true Hindu should refuse to learn the vulgar speech of the western regions."

(iii) Lastly, the Hindu mind was afflicted with a gross bias for centuries past, symptomatic of dogmatism and mental stagnation. The famous Indologist, Al-Beruni in his *Kittabul-Hind*, has recorded: "The Hindus think that there is no science, no knowledge which exists or has originated beyond the frontiers of the sacred land of India."

Guru Nanak aimed at opening the windows of the human mind to all the four quarters of space so that man's mind may grow freely and his soul remain whole through healthy contact with the insights gained by mankind in all countries, and in all ages. Hence, he preferred to use *qudrat* for nature in his compositions.

Recently, a Ph.D. thesis at Jamia Milia Islamia University, New Delhi was submitted by Faisal Mustafa on the subject, 'The World of Nature: A Quranic View'. Some of the conclusions of this study⁷ are:

- (i) The Quranic depiction of nature may serve as one of the most convincing proofs of 'one and only one creator', who has powers over all things and who regulates the affairs of the cosmos.
- (ii) Almighty god controls nature with all its manifestations, and it clearly indicates a well-defined order prevailing in nature.
- (iii) There is a very sound connectedness, harmony and inter-relationship among all the manifestations of nature.
- (iv) Supreme God governs the forces that are governing the affairs of this huge cosmos and these are willingly doing their specific functions.
- (v) The whole nature is full of beauty, bounty, and perfection.

By juxtaposition of Quranic term *qudrat* against the *Samkhya* term '*prakriti*', we can easily understand and appreciate the choice of the term *qudrat* to represent nature

in all its manifestations by Guru Nanak. In the opening verse of *Sri Guru Granth Sahib (SGGS)*, Guru Nanak defines the various attributes of God, the ultimate Reality. He calls Him 'Karta Purkh', the creator person and not merely a *purusha*. Hence in the scheme of things envisaged for his world-view, Guru Nanak employed *qudrat* to represent nature.

According to Kapur Singh,⁸ Guru Nanak employed the Arabic term *qudrat* as the second term of the dualism, with *Purkh* as the first. *Qudrat* means, "that under the power and authority of its Master". In *Quran*, *al-Qadir* as one of the attributes of God is distinguishable from another attribute, *al-Khaliq*, which means the creator. Guru Nanak includes both these attributes of God in his use of the term, *qudrat* for nature⁹:

ਆਪੇ ਕੁਦਰਤਿ ਕਰੇ ਸਾਜਿ ॥ ਸਚੁ ਆਪਿ ਨਿਬੇੜੇ ਰਾਜੁ ਰਾਜਿ ॥

He Himself creates and arranges the Nature,
He Himself controls its progression and evolution.

According to Guru Nanak, God first created Himself and then at a second stage of creation shaped *qudrat* (nature) out of his own goodwill to enjoy the creation process¹⁰:

ਆਪੀਨੈ ਆਪੁ ਸਾਜਿਓ ਆਪੀਨੈ ਰਚਿਓ ਨਾਉ ॥

ਦੁਯੀ ਕੁਦਰਤਿ ਸਾਜੀਐ ਕਰਿ ਆਸਣੁ ਡਿਠੋ ਚਾਉ ॥

The universal self (God) created the individual self,
He Himself created the differentiating names.
Thus Nature hath He created as the 'other',
And depositing Himself therein,
He contemplates on Nature.

In *Rāg Āsā*¹¹, Guru Nanak has written a long poem eulogizing *qudrat* in its various manifestations as revealed through the creation process. In fact, God not only plays the role of creator but also reveller and sustainer of creation through *qudrat* (nature):

ਕੁਦਰਤਿ ਦਿਸੈ ਕੁਦਰਤਿ ਸੁਣੀਐ ਕੁਦਰਤਿ ਭਉ ਸੁਖ ਸਾਰੁ ॥

ਕੁਦਰਤਿ ਪਾਤਾਲੀ ਆਕਾਸੀ ਕੁਦਰਤਿ ਸਰਬ ਆਕਾਰੁ ॥

Nature is all that appears and hears,
Nature is the world as seen, felt and appreciate.
Nature is all the spaces, and
Nature is totality of forms.

Nature, like God, is also limitless and beyond comprehension. The abode of God is nature itself¹²:

ਬਲਿਹਾਰੀ ਕੁਦਰਤਿ ਵਸਿਆ ॥ ਤੇਰਾ ਅੰਤੁ ਨ ਜਾਈ ਲਖਿਆ ॥

Glory to Thee who dwelleth in Nature,
Infinite and Eternal,
Thy limits and frontiers are unknowable.

Guru Nanak rejects the Vedantic concept that the created world and nature in all its manifestations is *Māyā*, a mere illusion, and only God is real. According to Sikh viewpoint, both God and *qudrat* (nature) are true as recorded in SGGS¹³:

ਸਚੀ ਤੇਰੀ ਕੁਦਰਤਿ ਸਚੇ ਪਾਤਸ਼ਾਹ ॥

O true Lord, Thy created Nature is real.

The study of nature has been given the highest priority in Gurbani. Guru Nanak has identified the manifest reality or God with Nature¹⁴:

ਨਾਨਕ ਸਚ ਦਾਤਾਰੁ ਸਿਨਾਖਤੁ ਕੁਦਰਤੀ ॥

Nanak, the beneficent Lord alone is true,
He is revealed through His Nature.

It is also emphasized in Gurbani that God or the creator can be realized by man in his own body through Nature¹⁵:

ਜਿਨਿ ਜਗੁ ਸਿਰਜਿ ਸਮਾਇਆ ਸੋ ਸਾਹਿਬੁ ਕੁਦਰਤਿ ਜਾਣੈਵਾ ॥

ਸਚੜਾ ਦੂਰਿ ਨ ਭਾਲੀਐ ਘਟਿ ਘਟਿ ਸਬਦੁ ਪਛਾਣੈਵਾ ॥

He who has created the world in which
He abides as Immanent,
That Lord may be recognized through Nature.
He is not to be regarded as wholly Transcendent;
His voice can be heard in every heart.

God being the Creator Person (*Kartā Purkh*) is also known as *Qadir* in Gurbani,¹⁶ using the *Quranic* vocabulary. He is the absolute controller of destiny of Man and Nature :

ਸਭ ਤੇਰੀ ਕੁਦਰਤਿ ਤੂੰ ਕਾਇਰੁ ਕਰਤਾ ਪਾਕੀ ਨਾਈ ਪਾਹੁ ॥

All that is your *qudrat*, and
You are its *Qadir* and *Kartā*, i.e.
Absolute controller and Creator.

God is the creator of Nature and He is fully involved and absorbed in Nature¹⁷:

ਆਪੇ ਕੁਦਰਤਿ ਸਾਜਿ ਕੈ ਆਪੇ ਕਰੇ ਬੀਚਾਰੁ ॥

God creates Nature and alone
He contemplates it.

We may conclude that Guru Nanak's vision of Nature is far more comprehensive than his predecessors both in the East and the West. It is holistic vision which can act as a platform for a dialogue between Science and Religion. Guru Nanak's mission was to create an ideal society of *Gurmukhs* (Guru-oriented personalities) where man can live in tune with nature. The message of Guru Nanak and his vision of nature need to be broadcast to the modern man in search of ecological balance and craving for inner peace.

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6

Concept of Time in Scientific and Sikh Traditions

Concept of Time in Scientific Tradition

Ancient civilizations were fully aware of the flow of time and designed calendars¹ to suit their convenience. We have ample records of calendars designed by Babylonians, Egyptians, Mayans and Aztecs and Indians even 4000 years before Christian era. These calendars were accurate enough to predict solar and lunar eclipses and to some extent weather and seasons. Change of seasons was linked to rotation of earth around the Sun or vice-versa. Egyptians could predict even the floods in the Nile River. Accurate measurement of time became possible only after the discovery of clock pendulum by Galileo. However, ancients had devised their own primitive methods of measurement of time using variation of shadows, sand and water clocks. The most accurate atomic clocks are recent phenomenon and one can estimate life times of elementary particles down to 10^{-24} of a second; or in other words, to the accuracy of one millionth millionth millionth millionth of a second.

Space and Time have been used as constructs in Physics since the times of Greek philosopher, Aristotle, along with concepts of Matter and Force. Universe was divided into two spheres: Celestial and Terrestrial. It was envisaged that two different sets of laws operate in these spheres. Celestial sphere was considered to be sacred and heavenly in nature, i.e. sacred and perfect while the terrestrial sphere was regarded as

imperfect and profane. Aristotle derived his conclusions using epistemology and logic and experimental observation was disregarded. His philosophy, and physics based on this philosophy, became the foundation for propagating monotheistic religions of the world, namely, Christianity and Islam. Aristotelean physics was adopted by the Christian church to preach geocentric theory till mid-fifteenth century when Copernicus rejected it in favour of heliocentric theory. Galileo and Newton laid the foundations of modern science, rejecting the Aristotelean ideas about Space, Time, Matter and Motion.

Concept of Time was central to the laws of Physics formulated by Newton. However, he considered Time as absolute in the same way as Space and God. In other words, flow of time is constant irrespective of the motion of the observer or of moving bodies. If the clock is set with reference to a standard clock, it will give accurate time measurement for all future events and observers, irrespective of their relative motions. Pendulum clocks were designed using the principle of time period of a simple pendulum discovered by Galileo, even before Newton.

An event is something that happens at a particular point in space and at a particular time. We can specify all events by four coordinates; three of space (x, y, z) and one of time (t). Choice of space coordinates depends upon our convenience and we can specify the place of occurrence of an event by any three coordinates, viz., latitude, longitude and altitude. Newton was a devout Christian and he considered Space and Time as Absolutes in conformity with Absolute idea of a God. Bishop Berkeley was highly critical of Newton and he believed like our *Vedantins*, that all material objects and space and time are an illusion.

Before 1905, space and time were thought of as a fixed arena in which events took place, but which was not affected by what happened in it. It was Einstein's theory of special and general relativity which brought a revolutionary change in the conception of space and time. According to the special theory postulate, velocity of light is fixed and remains constant

irrespective of motion of source or observer. We observe it as a matter of common sense experience that two trains on parallel tracks appear slow or fast depending upon their relative direction of motion. If they happen to move with the same velocity in the same direction, they appear stationary, provided we do not look out of the window at rail tracks or objects outside the train. The whistle of an approaching train appears shriller than the one moving away from us. So in Newtonian world, common sense experience validates our concept of Absolute time.

However, in relativistic world when velocities approach velocity of light, the results of experiments defy our common sense experience. It was genius of Einstein who took a quantum jump to explain results of experiments at very high velocities by assuming that if velocity of light remains constant for all observers, it is the time interval which is affected by relative motion. For example, consider a pair of twins. If one of the twins went for a long trip in a spaceship at nearly the speed of light and the other remained back home on earth. When the first twin returns from his space odyssey, he will find his twin brother on Earth much older. This is known as the Twin Paradox in scientific literature.

General theory of relativity² predicts that time should appear to run slower near a massive body like the Sun. Space and time are now considered to be dynamic quantities: when a body moves, it affects the curvature of space and time. Space and time are not flat but curved by the presence of massive bodies. Space and time are not absolutes: they are affected by everything that happens in the universe.

Arrow of Time: If time flows, then it must be assigned an arrow³ to determine its direction of flow. In fact, time has three arrows: thermodynamic arrow, psychological arrow and cosmological arrow. Second law of thermodynamics is one of the corner-stones of classical physics. According to this law, entropy always tends to increase in this Universe. Since entropy is a measure of disorder, it implies that disorder always tends to increase in this universe. Most of the processes are irreversible in nature, causing increase in entropy.

Thermodynamic arrow of time distinguishes the past from the future, giving a direction to time. Then, there is the psychological arrow of time. This is the direction in which we feel time passes, the direction in which we remember the past but not the future. Finally, there is the cosmological arrow of time. This is the direction of time in which the Universe is expanding rather than contracting.

Our Universe has no boundary condition, as a result thermodynamic arrow and cosmological arrow of time point in the same direction. If they do not obey this condition, then intelligent human beings cannot exist in the Universe. If psychological arrow of time points in the opposite direction, we can remember our future but not the past. The psychological arrow of time is determined within our brain by the thermodynamic arrow of time. If the universe starts contracting, people in the contracting phase would live their lives backward: they would die before they were born and get younger as the Universe contracted. However, the laws of science do not distinguish between the forward and backward directions of time and are equally valid in both situations.

During the creation phase of the Universe, laws of physics do not hold good and it is called a singularity. In the micro-world of elementary particles, another strange phenomenon has been observed. The laws of physics must change if one reverses the direction of time. It is known as Time Reversal symmetry violation. It has very strange consequences: the mirror image or Parity is also violated, which means particles and antiparticles show different behaviour. However, there is a mathematical theorem, which states that combined symmetry CPT is not violated in the Universe.

One paradox was pointed out by Saint Augustine of imagining God as a Being existing in time: time is property only of the universe that God created. He is beyond Time and Space which were created at the epoch of Big-Bang. How true it is? We find an echo of this concept in the Sikh sacred literature, both in *Sri Guru Granth Sahib* and *Dasam Granth*, personifying God as *Akāl Purkh* (The Timeless Being).

Concept of Time in Sikh Tradition

It is very clearly mentioned in *SGGS* that Time is created along with the Universe by God. This conception of Time is analogous to creation hypothesis of Big-Bang.⁴ Space and Time are created out of a “Singularity” at the epoch of Big-Bang along with the creation of matter and radiation. Time has a beginning and an end and it cannot be treated as absolute or eternal as God.

Different manifestations of Time are also elaborated in *SGGS*. In most of the Gurbani *sabdas*, Time is equated to death (*Kāl*). Time has a predominant role to play in Sikh metaphysics and it is being used as a tool in the hands of God to annihilate everything created by Him. But God himself is beyond the grip of Time. Hence God is defined by a key-note attribute as *Akāl Mūrat* (Time-Transcendent Reality), which is evident from the following verses in *SGGS*⁵⁻⁸:

ਸਫਲ ਦਰਸਨੁ ਅਕਾਲ ਮੂਰਤਿ ਪ੍ਰਭੁ ਹੈ ਭੀ ਹੋਵਨਹਾਰਾ ॥

Fruitful is the Blessed Vision of His *Darshan*;
God is Time-Transcendent, He is and shall always be.

ਅਕਾਲ ਮੂਰਤਿ ਜਿਸੁ ਕਦੇ ਨਾਹੀ ਖਉ ॥

His form is Time-Transcendent, it is never destroyed.

ਤੂੰ ਅਕਾਲ ਪੁਰਖੁ ਨਾਹੀ ਸਿਰਿ ਕਾਲਾ ॥

You are the Deathless Primal Being
Death does not hover over Your head.

ਸਤਿ ਪੁਰਖ ਅਕਾਲ ਮੂਰਤਿ ਰਿਦੈ ਧਾਰਹੁ ਧਿਆਨੁ ॥

Within your heart, focus your meditation on the
True Primal Being, the Time-Transcendent Reality.

The Vedic seers (*Rishis*) were fully aware of the changing nature of the universe. They knew that to change means to perish. Hence they termed Time as *Kāl*, which means death in its literal meaning. Indian seers never differentiated time from death. In *SGGS*, Sikh Gurus have followed the same tradition and Time (*Kāl*) is used to represent death. Death cannot be avoided or postponed; however, the fear of death can be removed by meditation on True Name⁹⁻¹²:

ਹਰਿ ਸਿਮਰਿ ਸਿਮਰਿ ਕਾਟਿਆ ਭਉ ਕਾਲ ॥

Meditating continuously on the True Lord, I am rid of the fear of death.

ਸਭੁ ਜਗੁ ਬਾਧੋ ਕਾਲ ਕੋ ਬਿਨ ਗੁਰ ਕਾਲੁ ਅਫਾਰੁ ॥

The whole world is bound by death;
Without the Guru fear of death cannot be avoided.

ਜਿਨਾ ਸਤਿਗੁਰੁ ਪੁਰਖੁ ਨ ਭੋਟਿਓ ਸੇ ਭਾਗਹੀਣੁ ਵਸਿ ਕਾਲ ॥

Those who have not met the Primal Being, The True Guru,
Are most unfortunate and subject to death.

ਕਾਲ ਜਾਲ ਅਰੁ ਮਹਾ ਜੰਜਾਲਾ ਛੁਟਕੇ ਜਮਹਿ ਡਰਾ ॥

Death's noose and its mighty entanglements have vanished,
Along with the fear of death.

Indian seers of Vedic lore and Nath-Yogis, remnants of Buddhist lore, desired to conquer death and enter the realm of eternity or timelessness. In *Siddh Goshti*, Guru Nanak was asked to answer many queries of *Siddhas* and the following one refers to death¹³:

ਕਾਲ ਕਾ ਠੀਗਾ ਕਿਉ ਜਲਾਈਅਲੇ ਕਿਉ ਨਿਰਭਉ ਘਰਿ ਜਾਈਐ ॥

How one can avoid the attack of death?

How one can enter the realm of fearlessness?

Cosmological time has been divided into *Yugas* (epochs) by the Indian seers. They divided Time into four *Yugas*, namely, *Satyug*, *Tretayug*, *Dwaparyug* and *Kaliyug*. We are passing through *Kaliyug*, known as the Iron Age or Dark Age of the Universe.

Sikh Gurus have referred to the present epoch in somewhat derogatory terms but also suggested a way out for liberation in *Kaliyug*¹⁴⁻¹⁶:

ਕਲੀ ਕਾਲ ਮਹਿ ਇਕ ਕਲ ਰਾਖੀ ॥

In the Iron Age, the Dark Age of *Kaliyuga*, only one power remains.

ਕਲੀ ਕਾਲ ਮਹਿ ਰਵਿਆ ਰਾਖੁ ॥

In this Dark Age of *Kaliyuga*, the Lord is all pervading.

ਗਰਭ ਜੋਨਿ ਕਲਿ ਕਾਲ ਜਾਲ ਦੁਖ ਬਿਨਾਸਨੁ ਹਰਿ ਰਖੇ ॥

The Lord saves us from the womb of reincarnation
And the noose of death in this Dark Age of *Kaliyuga*;
He takes away our pain.

Concept of Timeless Being (*Akāl*) in *Dasam Granth*

Guru Gobind Singh, the Tenth Master, has personified God by the term *Akāl*, the Time – Transcendent Reality. He has saluted God in the form of *Akāl* and sought his protection for promoting *Dharma* and rule of law on this earth. Creation of Khalsa was under the command of *Akāl* with the ulterior motive of establishment of divine sovereignty of *Akāl* in this universe. Guru Gobind Singh claimed that Khalsa is the sovereign army of the *Akāl Purkh*¹⁷:

ਖਾਲਸਾ ਅਕਾਲ ਪੁਰਖ ਕੀ ਫੌਜ ॥

ਪ੍ਰਗਟਿਓ ਖਾਲਸਾ ਪ੍ਰਮਾਤਮ ਕੀ ਮੌਜ ॥

Khalsa is sovereign army of God,
Khalsa creation is sanctioned by God.

According to Puran Singh¹⁸ : “In the constitution of the Khalsa commonwealth, the greatest act of genius of Guru Gobind Singh was when he transferred the divine sovereignty vested in him to the God-inspired people, the Khalsa.”

In *Akal Ustat*, Guru Gobind Singh refers to multifarious forms of creation in this universe which are created and annihilated by *Kāl* (Time) but the maker of *Kāl*, the *Akāl*, is eternal¹⁹:

ਜਲ ਕਹਾ ਥਲ ਕਹਾ ਗਗਨ ਕੇ ਗਉਨ ਕਹਾ

ਕਾਲ ਕੇ ਬਨਾਏ ਸਭੇ ਕਾਲ ਹੀ ਚਬਾਹਿਗੇ ॥

What to think of water, earth and sky,
All are created by Time and annihilated by Time.

Eternity of *Akāl* is stressed in the composition of *Bachitar Natak* (The Wonderful Drama) by Guru Gobind Singh²⁰:

ਕਾਲ ਹੀ ਪਾਇ ਭਯੋ ਭਗਵਾਨ ਸੁ ਜਾਗਤ ਯਾ ਜਗ ਜਾਕੀ ਕਲਾ ਹੈ ॥

ਕਾਲ ਹੀ ਪਾਇ ਭਯੋ ਬ੍ਰਹਮਾ ਸਿਵ ਕਾਲ ਹੀ ਪਾਇ ਭਯੋ ਜੁਗੀਆ ਹੈ ॥

ਕਾਲ ਹੀ ਪਾਇ ਸੁਰਾਸੁਰ ਰੰਧ੍ਰੁ ਜੱਛ ਭੁਜੰਗ ਦਿਸਾ ਬਿਦਿਸਾ ਹੈ ॥

ਔਰ ਸੋ ਕਾਲ ਸਭੇ ਬਸਿ ਕਾਲ ਕੇ ਏਕ ਹੀ ਕਾਲ ਅਕਾਲ ਸਦਾ ਹੈ ॥

God exists in time when He creates the World,
 Brahma and Siva also exist in Time;
 And so are the demi-gods and other creatures;
 All creations of God are subject to whims of Time,
 Only the God, the Timeless Being, is ever eternal.

Kāl is a manifestation of *Akāl*, the Ultimate Reality, in the same way as *Sargun* and *Nirgun* are two aspects of the same Reality.

According to Talib,²¹ the concept of *Akāl* is central and integral to Sikh tradition and thinking. However, Pannu²² goes a step further and claims that the concept of *Akāl* is the axis of Sikh religion, its philosophy and culture. In fact, the only term which is most appropriate to represent Sikh religion and its ethos is *Akāl*.

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The Origin of Life and Evolution according to Science and Gurbani

There is no general consensus among the scientists about the origin of life in the universe. Various theories have been put forward to explain the origin and evolution of life in the same manner as the origin of universe and our solar system. A group of scientists believe that there is no life in the universe except on our earth. However, the search for extra-terrestrial origin of life is being supported by another group of scientists. It still remains a mystery, both for the scientists and the common man.

Spontaneous Generation Hypothesis

It was the brain child of Greek philosophers and Aristotle believed in it. The formation of living creature from materials that are not alive, is known as the hypothesis of 'spontaneous generation'. Like other Greek ideas, this hypothesis held its sway in Europe through the middle ages. The seventeenth century biologist observed appearance of maggots in decaying flesh. The biologists also saw earth worms coming out of the soil and frogs emerging from the slime on the surface of a pond. This hypothesis got moral support from the Church as it corroborated the genesis story of the *Bible* about the origin of life.

Rene Descartes¹ suggested that spontaneous generation was an entirely natural process occurring independently of any sort of metaphysical life principle whenever the material conditions were favourable. Naturalist J.T. Needham² also

believed in this hypothesis. He experimented and found that micro-organisms arose spontaneously from putrefying organic substances. F.A. Pouchet³ argued that life must somehow arise from non-living matter, if not how life came about in the first instance. However, this hypothesis was not accepted by most of the scientists in Europe who argued that : “ The earth worms grew out of tiny eggs that had been laid by other worms and frogs grew from jelly like eggs laid by parent frogs on the surface of water.”

Louis Pasteur, the French micro-biologist, rejected the hypothesis of spontaneous generation. He was of the view that organisms that appeared in infusions of Pouchet were derived from spores present in the air. When exposed to air, they had a rich growth of bacteria but if air is prevented to interact with the infusion, no organism appeared. This served as a death blow to the spontaneous generation hypothesis. By the end of nineteenth century, biologists had come to the conclusion that: (a) Life comes from life only, (b) Like produces like, and (c) Life cannot possibly have come from non-life.

Hypothesis of Pure Chance

Many scientists believed in the sudden appearance of living molecules, particles of viruses or genes which were endowed with all the attributes of life from their very formation. T.H. Morgan⁴ promoted the gene theory of life; according to him, the first organic things which showed signs of life were genes. Genes are physical units located on chromosomes within the nucleus of the cell. They control every step of organism's development from the first effect in the zygote, through the development of the embryo to the full functioning of the adult. In a way, genetic code determines the inherent characteristics of species. It may be noted that chance combination of organic molecules for origin of life seems to be a highly improbable event in the field of scientific knowledge.

Other Hypotheses of Origin of Life

Hypothesis of Eternity of life assumes that life always existed in the universe and had no beginning. This concept of

eternity of life is incompatible with the generally accepted scientific concept according to which both universe and earth have a beginning; therefore, they are not eternal. Thus, life is a latter product than that of the earth and hence cannot be eternal.

Hypothesis of Transportation of life on Earth gained some measure of popularity after the advent of space age. The study of cosmic dust and meteorites proved that spores of micro-organisms can be carried through interstellar space on to the surface of earth. There are two arguments against this hypothesis: (i) Life probably does not exist on other planets in our solar system and other galaxies, and (ii) it does not solve the problem as to how the life originated in the universe.

Hypothesis of Accidental Mixing of Chemicals became quite popular with biochemists who believe that the atmosphere of the primitive earth was composed of methane, ammonia, water vapour and hydrogen. It is believed that these simple chemical molecules gradually combined to form complex molecules under the influence of solar radiation. Finally, these complex molecules converted into systems that had the unique feature of replication and self-production leading to origin of life.

Experiments were carried out by Stanley Miller and Harold Urey during 1850s in the laboratory of Chicago University by mixing methane, ammonia and hydrogen gases and water vapour under simulated pre-biotic conditions. They were able to produce twenty different types of amino acids, the basic constituents of proteins, but failed to provide a convincing proof in support of this hypothesis. We may conclude that origin of life in our universe still remains a mystery for the scientific world.

Evolution of Life

Most of scientists believe in 'cosmic evolution' leading to formation of galaxies, solar systems and planets, and the 'organic evolution', leading to different species of living organisms. Both these processes have been going on in the history of our universe, cosmic evolution leading the organic evolution almost by more than a few billion years.

Charles Darwin's hypothesis of natural selection⁵ is the most splendid theory of organic evolution. It is based on the concept of survival of the fittest. Natural selection thus brings about the gradual evolution of new species of those already in existence. This theory considers that living organisms began with the appearance of 'protoplasm' about two billion years ago in sea waters. The plants and animals developed from single cells over the next billion years leading to the final stage of evolution, the man. According to evolutionary theory, man is undoubtedly the highest and the most complex form of life and has reached the highest rung of the evolutionary ladder. Our closest relatives are apes, gorillas, and chimpanzees. Our genetic code is almost identical with them. There are many opponents to evolutionary theory of origin of species but it is the most successful theory till date in biology. The most vehement opposition to this theory came from the Christian church as it demolishes the genesis story of the *Bible*.

Origin and Evolution of Life in Gurbani

Various theories of origin and evolution of life have been put forward in the holy books of all religions. But one thing is common to all of them: God is the creator of life in this universe. Guru Nanak also accepts this postulate of God as the Creator of the universe and life in all its manifestations. However, Guru Nanak also accepts the theory of evolution in his own characteristic manner without taking recourse to the concept of natural selection in the Darwinian way.

In Japuji,⁶ Guru Nanak refers to the creation of various forms and living beings under the divine law (*hukam*). But this divine law is incomprehensible :

ਹੁਕਮੀ ਹੋਵਨਿ ਆਕਾਰ ਹੁਕਮੁ ਨ ਕਹਿਆ ਜਾਈ ॥
ਹੁਕਮੀ ਹੋਵਨਿ ਜੀਅ ਹੁਕਮਿ ਮਿਲੈ ਵਡਿਆਈ ॥

In *SGGS*,⁷ Guru Arjan poses the question about the origin of life and himself answers it :

ਕਿਥਹੁ ਉਪਜੈ ਕਹ ਰਹੈ ਕਹ ਮਾਹਿ ਸਮਾਵੈ ॥
ਜੀਅ ਜੰਤ ਸਭਿ ਖਸਮ ਕੇ ਕਉਣੁ ਕੀਮਤਿ ਪਾਵੈ ॥

Where do we come from? Where do we live?

Where do we go in the end?

All creatures belong to God, Who can place a value on Him?

In *Siddh-Goshti*,⁸⁻⁹ Guru Nanak answers the queries of *Siddhas* regarding creation of life, mind and the universe as follows:

Q.1 ਜਾ ਇਹੁ ਹਿਰਦਾ ਦੇਹ ਨ ਹੋਤੀ ਤਉ ਮਨੁ ਕੈਠੈ ਰਹਤਾ ॥

When this heart and the body did not exist, where did the mind reside?

A.1 ਹਿਰਦਾ ਦੇਹ ਨ ਹੋਤੀ ਅਉਧੂ ਤਉ ਮਨੁ ਸੁੰਨ ਰਹੈ ਬੈਰਾਗੀ ॥

When the heart and the body did not exist, O hermit, then the mind resided with Absolute Lord in the void.

Q.2 ਕਵਣ ਮੂਲੁ ਕਵਣ ਮਤਿ ਵੇਲਾ ॥

What is the root, the source of life?

What teachings hold for these times?

A.2 ਪਵਨ ਅਰੰਭੁ ਸਤਿਗੁਰ ਮਤਿ ਵੇਲਾ ॥

Pray Sir, it is air that supports life.

And, the true Guru's message is the creed of the day.

According to Guru Nanak, all the living things such as plants, birds and animals etc. are made of three elements, namely, material body, soul and *prāṇa*. These elements owe their origin to the Absolute Lord. The hypothesis¹⁰ of Guru Nanak is simple and straightforward:

ਸਾਚੇ ਤੇ ਪਵਨਾ ਭਇਆ ਪਵਨੈ ਤੇ ਜਲੁ ਹੋਇ ॥

ਜਲ ਤੇ ਤ੍ਰਿਭਵਣੁ ਸਾਜਿਆ ਘਟਿ ਘਟਿ ਜੋਤਿ ਸਮੋਇ ॥

The True Lord created the air,

From air, water arose.

From water, creation arose.

His Light permeates all creation.

Guru Nanak considers the human body as a vehicle of soul.¹¹ Prime importance is given to soul in Sikh metaphysics. Body is also called temple of God. If a man's soul is not tuned to God, he is as good as dead.

ਜੀਉ ਪਾਇ ਤਨੁ ਸਾਜਿਆ ਰਖਿਆ ਬਣਤ ਬਣਾਇ ॥

Having created the body, the Creator put soul into it and made arrangements to protect it.

We find reference to evolution of species in the universe in Gurbani without taking recourse to any scientific theory of evolution. Sikh Gurus generally followed the traditional Hindu view of eight million and four hundred thousand species¹² of living organisms in the universe. Man is the *sumum bonnum* of this creation.

ਲਖ ਚਉਰਾਸੀਹ ਜੰਤ ਉਪਾਏ ॥

God has created eighty-four lakh (8.4 million) species of beings.

There is a classification of all living organisms into four categories¹³⁻¹⁴ on the basis of their origin. They are grouped as under:

- (i) Those born from egg (*aṇḍaj*),
- (ii) Those born from womb (*jeraj*),
- (iii) Those born from earth (*utbhuj*), and
- (iv) Those born from sweat (*setaj*).

ਅੰਡਜ ਜੇਰਜ ਉਤਭੁਜ ਖਾਣੀ ਸੇਤਜਾਹ ॥

ਸੋ ਮਿਤਿ ਜਾਣੈ ਨਾਨਕਾ ਸਰਾਂ ਮੇਰਾਂ ਜੰਤਾਹ ॥

ਨਾਨਕ ਜੰਤ ਉਪਾਇ ਕੈ ਸਮਾਲੇ ਸਭਨਾਹ ॥

Egg born, womb born, earth born and sweat born; are all Thine creatures.

Oceans, mountains, and all beings – O Nanak, He alone knows their condition.

O Nanak, having created the living beings, He cherishes them all.

ਅੰਡਜ ਜੇਰਜ ਉਤਭੁਜ ਸੇਤਜ ਤੇਰੇ ਕੀਤੇ ਜੰਤਾ ॥

ਏਕੁ ਪੁਰਖੁ ਮੈ ਤੇਰਾ ਦੇਖਿਆ ਤੂ ਸਭਨਾ ਮਾਹਿ ਰਵੰਤਾ ॥

Egg born, womb born, earth born and sweat born; are all created by You.

I have seen one glory of Yours, that You are pervading and permeating in all.

In SGGS, it is also mentioned by Bhagat Namdev¹⁵ that forty-two lakh species exist in water and the same number

exists on land. Science has failed to confirm this hypothesis:

ਬਇਆਲੀਸ ਲਖ ਜੀ ਜਲ ਮਹਿ ਹੋਤੇ ਬੀਠਲੁ ਭੋਲਾ ਕਾਇ ਕਰਉ ॥

The message of Sikh Gurus is enshrined in SGGGS. In the final analysis, we can quote a relevant stanza in support of biological evolution of species¹⁶:

ਕਈ ਜਨਮ ਭਏ ਕੀਟ ਪਤੰਗਾ ॥

ਕਈ ਜਨਮ ਗਜ਼ ਮੀਨ ਕੁਰੰਗਾ ॥

ਕਈ ਜਨਮ ਪੰਖੀ ਸਰਪ ਹੋਇਓ ॥

ਕਈ ਜਨਮ ਹੋਵਰ ਬ੍ਰਿਖ ਜੋਇਓ ॥

ਮਿਲੁ ਜਗਦੀਸ ਮਿਲਨ ਕੀ ਬਰੀਆ ॥

ਚਿਰੰਕਾਲ ਇਹ ਦੇਹ ਸੰਜਰੀਆ ॥

In so many incarnations, you were a worm and an insect;
In so many incarnations, you were an elephant, a fish and a deer;

In so many incarnations, you were a bird and a snake;
In so many incarnations, you were yoked as an ox and a horse.

Meet the Lord of the Universe – now is the time to meet Him.

After such a long epoch, you are born as a human being.

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World-View in Sikh Religion

What is the meaning of world-view? It is a set of fundamental beliefs, attitudes, values, etc., which determine or constitute a comprehensive outlook on life and the universe.¹ In every religion or spiritual system, the concept of God or Ultimate Reality determines its world-view and its structure.² Our thesis on the world-view in Sikh religion will be formulated on three basic concepts:

1. Concept of God/Ultimate Reality
2. Concept of Universe/World
3. Concept of Ideal Man/Society

1. Concept of God/Ultimate Reality in Sikhism

The Sikh scripture, *Sri Guru Granth Sahib*, defines the concept of God through His attributes³:

ੴ ਸਤਿ ਨਾਮੁ ਕਰਤਾ ਪੁਰਖੁ ਨਿਰਭਉ ਨਿਰਵੈਰੁ ਅਕਾਲ ਮੂਰਤਿ ਅਜੂਨੀ ਸੈਭੰ
ਗੁਰ ਪ੍ਰਸਾਦਿ ॥

Eternal Unity, the *Om* that has assumed the Creation-Body; Being of Truth; Creator Person; Without Fear or Hatred; Beyond Time and Space; Spirit-born/Unborn; Self-Existent; Transcendental Cosmic-Spirit made manifest by grace of the Guru.

The concept of God as Creator Person of the world has far reaching implications in the religious history of India. A positive relation between God and the world is a revolutionary postulate in Sikhism, which forms the basis of Sikh Cosmology. God is both Transcendent and Immanent. He is both in the

universe and outside it. Sikhism dialectically unites the ideas of God and world. Transcendence shows that God is prior to and distinct from the world. Immanence of God is a symbolic way of expressing God's connection with the world. God himself transforms into creation, which is, changing His *nirguṇa* form into *sarguṇa* form⁴:

ਸਰਗੁਨ ਨਿਰਗੁਨ ਨਿਰੰਕਾਰ ਸੁੰਨ ਸਮਾਧੀ ਆਪਿ ॥
ਆਪਨ ਕੀਆ ਨਾਨਕਾ ਆਪੇ ਹੀ ਫਿਰਿ ਜਾਪਿ ॥

The formless God (*Nirāṅkāra*) manifests Himself in the creation, and there is no dichotomy in *nirguṇa* and *sarguṇa* forms⁵:

ਨਿਰੰਕਾਰ ਆਕਾਰ ਆਪਿ ਨਿਰਗੁਨ ਸਰਗੁਨ ਏਕ ॥
ਏਕਹਿ ਏਕ ਬਖਾਨਨੋ ਨਾਨਕ ਏਕ ਅਨੇਕ ॥

Nature of Ultimate Reality

Metaphysics^{6,7} is a systematic and sustained enquiry into the nature of ultimate reality. It is an attempt to know the reality against mere appearance. Religion relies both on reason and revelation in its attempt to study the nature of reality. To the Indian philosopher, experience is the ultimate test of truth. Since the reality is trans-empirical, it cannot be known through sense experience but through intuitive experience (*anubhūti*); it is the experience of the highest level, for it transcends both the rational and the sensory aspects of human experience with which we are normally acquainted. The following hymn of Guru Angad Dev alludes to the transcendental nature of reality⁸:

ਅਖੀ ਬਾਝਹੁ ਵੇਖਣਾ ਵਿਣੁ ਕੰਨਾ ਸੁਨਣਾ ॥
ਪੈਰਾ ਬਾਝਹੁ ਚਲਣਾ ਵਿਣੁ ਹਥਾ ਕਰਣਾ ॥
ਜੀਭੈ ਬਾਝਹੁ ਬੋਲਣਾ ਇਉ ਜੀਵਤ ਮਰਣਾ ॥
ਨਾਨਕ ਹੁਕਮੁ ਪਛਾਣਿ ਕੈ ਤਉ ਖਸਮੈ ਮਿਲਣਾ ॥

In this realm, one sees but without the eyes; one listens but without the ears; one walks but without the feet; one works but without the hands; one speaks but without the tongue; thus attaining life in death. O Nanak, one meets God after realization of the divine law.

According to *Upanishads*, *Brahm* or *Atma*, which is the ultimate reality, is of the nature of existence (*Sat*), consciousness (*Chit*), and bliss (*Ananda*). It is one only and non-dual. The pluralistic universe is only an illusory appearance of *Brahm* or *Atma* due to *māyā* or *avidyā*. There are two views of reality in the *Upanishads*, the cosmic view and the acosmic view. These two views serve as the basis for theistic and absolutistic schools of thought in Vedanta.

Sikhism fundamentally differs from this standpoint of Vedanta. The world is neither *māyā* nor a perversion. It is a *dharamsāla*, a place for righteous actions. Guru Nanak discards the Vedantic conception of reality in *Āsā-dī-Vār*, and definitely proclaims that this universe is real, not an illusion⁹:

ਸਚੇ ਤੇਰੇ ਖੰਡ ਸਚੇ ਬ੍ਰਹਮੰਡ ॥
 ਸਚੇ ਤੇਰੇ ਲੋਅ ਸਚੇ ਆਕਾਰ ॥
 ਸਚੇ ਤੇਰੇ ਕਰਣੇ ਸਰਬ ਬੀਚਾਰ ॥

Real are Thy continents; Real is the universe;
 Real are these forms and material objects;
 Thy doings are real, O Lord.

Further, the Guru calls the universe as His mansion¹⁰:

ਇਹੁ ਜਗੁ ਸਚੈ ਕੀ ਹੈ ਕੋਠੜੀ, ਸਚੇ ਕਾ ਵਿਚਿ ਵਾਸੁ ॥

This moving universe is the divine mansion of the True Lord;
 And the True One lives therein.

2. Concept of Universe/World

Sikh cosmology challenges the Hindu world-view as archaic, and based on dogma. In *Japuji*¹¹, Guru Nanak sums up his view-point about creation of the universe, which he elaborates in a most scientific manner in *Rāga Mārū Solhe*. His creation hypothesis is summed up as follows:

ਕੀਤਾ ਪਸਾਉ ਏਕੋ ਕਵਾਉ ॥ ਤਿਸ ਤੇ ਹੋਏ ਲਖ ਦਰੀਆਉ ॥

God created the universe by uttering a word.

Guru Nanak poses the question¹²:

ਕਵਣੁ ਸੁ ਵੇਲਾ ਵਖਤੁ ਕਵਣੁ ਕਵਣੁ ਭਿਤਿ ਕਵਣੁ ਵਾਰੁ ॥

ਕਵਣਿ ਸਿ ਰੁਤੀ ਮਾਹੁ ਕਵਣੁ ਜਿਤੁ ਹੋਆ ਆਕਾਰੁ ॥

What was the time and the moment,
the day and the month,
When the world was created?

In the next stanza, he talks of the prevailing view-points¹³:

ਵੇਲ ਨ ਪਾਈਆ ਪੰਡਤੀ ਜਿ ਹੋਵੈ ਲੇਖੁ ਪੁਰਾਣੁ ॥
ਵਖਤੁ ਨ ਪਾਇਓ ਕਾਦੀਆ ਜਿ ਲਿਖਨਿ ਲੇਖੁ ਕੁਰਾਣੁ ॥
ਥਿਤਿ ਵਾਰੁ ਨਾ ਜੋਗੀ ਜਾਣੈ ਰੁਤਿ ਮਾਹੁ ਨਾ ਕੋਈ ॥
ਜਾ ਕਰਤਾ ਸਿਰਠੀ ਕਉ ਸਾਜੇ ਆਪੇ ਜਾਣੈ ਸੋਈ ॥

Neither the Pundit can find this date
by looking through the *Purāṇa* texts,
Nor can the Qazi tell from the *Koran*,
Neither the Yogi nor anyone else knows
the day, week, season and month of creation.
The Creator who creates the world,
He alone knows the time.

In *Mārū Solhe*, Guru Nanak versifies his thoughts about the 'epoch' before creation which is referred to as '*sūnya*', a concept at variance with the *sūnyatā* philosophy of Buddhism. The Guru envisages creation out of this *sūnya* phase¹⁴:

ਪਉਣੁ ਪਾਣੀ ਸੁੰਨੈ ਤੇ ਸਾਜੇ ॥ ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ ॥

From the *sūnya*, He created air and water.
He created universe and the man in the fortress of body.

According to Guru Amar Das,¹⁵⁻¹⁶ the *sūnya* phase lasted for as long as 36 *yugas* (38.88×10^6 solar years) before the creation phase started:

ਜੁਗ ਛਤੀਹ ਗੁਬਾਰੁ ਕਰਿ ਵਰਤਿਆ ਸੁੰਨਾਹਰਿ ॥

ਛਤੀਹ ਜੁਗ ਗੁਬਾਰੁ ਸਾ ਆਪੇ ਗਣਤ ਕੀਨੀ ॥

According to the 'Big-Bang' model of the universe, the creation started some 15 billion years ago after a big-bang when infinitely dense matter 'Primeval Atom' exploded creating an immense flux of radiation (energy quantas). Within a microsecond, elementary particles were created which are basic building blocks of matter. From this primeval nebular medium

known as 'gas cloud', galaxies and solar systems emerged. This creation process is going on till date. Stars are born in galaxies, million times brighter and much heavier than our sun, grow from 'red giants' to 'white dwarfs' and explode either as 'supernovae' or turning into invisible 'black holes'. It is predicted that 'black holes' are such demons that can annihilate the solar systems and other celestial bodies. Such is the fate of this universe, yet to be fully explored by cosmologists.

This wonderful drama of creation is elucidated further by Guru Nanak in his mystic reverie in *Mārū Solhe*, which has assumed the role of touchstone for Sikh cosmology vis-a-vis its scientific counterpart. Surprisingly, there is a perfect correspondence between the epoch of 'big-bang' and the creation out of *sīnya* phase as enunciated in *Sri Guru Granth Sahib*¹⁷:

ਅਰਬਦ ਨਰਬਦ ਧੰਧੂਕਾਰਾ ॥ ਧਰਟਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ ॥
ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ ॥...

For billions of years, there was nothing but utter darkness. There was neither day nor night, nor moon, nor sun, but the Lord alone sat in profound trance. Neither there was creation, nor air, nor water. There were no continents, nor underworlds, nor seven oceans nor rivers, nor the flowing water. There was neither death, nor time. There was no Brahma, nor Vishnu or Shiva.

When He so willed, He created the world and supported the firmament without support. He created Brahma, Vishnu and Shiva and extended the love of mammon. He founded the continents, solar systems and underworlds, and from the Absolute self, He became manifest.

Guru Arjan Dev describes in *Sukhmani*¹⁸ the myriad forms of creation:

ਕਈ ਕੋਟਿ ਖਾਣੀ ਅਹੁ ਖੰਡ ॥ ਕਈ ਕੋਟਿ ਅਕਾਸ ਬ੍ਰਹਮੰਡ ॥
ਕਈ ਜੁਗਤਿ ਕੀਨੋ ਬਿਸਥਾਰ ॥ ਕਈ ਬਾਰ ਪਸਰਿਓ ਪਾਸਾਰ ॥
ਸਦਾ ਸਦਾ ਇਕੁ ਏਕੰਕਾਰ ॥

There are millions and millions of galaxies and solar systems in the universe. The phenomenon of creation has occurred so many times. But the one Lord remains for ever and ever.

The riddle of creation of the universe will remain an enigma for cosmologists and there is no final word yet in cosmology. About the present theories and models, we may conclude with a quotation from *Benati Chaupai* in the *Dasam Granth*¹⁹:

ਆਪੁ ਆਪਨੀ ਬੁਧਿ ਹੈ ਜੇਤੀ ॥ ਬਰਨਤੁ ਭਿੰਨ-ਭਿੰਨ ਭੁਹਿ ਭੇਤੀ ॥

ਤੁਮਰਾ ਲਖਾ ਨ ਜਾਇ ਪਸਾਰਾ ॥ ਕਿਹੁ ਬਿਧਿ ਸਜਾ ਪ੍ਰਥਮ ਸੰਸਾਰਾ ॥

Everyone explains the creation process according to his intellect, but no one can tell, O Lord, how you first created the universe.

3. Concept of Ideal Man/Society

The most important concept in the Sikh world-view is the creation of an ideal man in the universe, the '*Gurmukh*' of Guru Nanak or the '*Khalsa*' of Guru Gobind Singh. In the opening stanza of *Japuji*, Guru Nanak poses the question²⁰:

ਕਿਵ ਸਚਿਆਰਾ ਹੋਈਐ ਕਿਵ ਕੂੜੈ ਤੁਟੈ ਪਾਲਿ ॥

How can we become *sachiārā*?

How can we break the bonds of falsehood?

And then he answers himself in the same stanza²¹:

ਹੁਕਮਿ ਰਜਾਈ ਚਲਣਾ ਨਾਨਕ ਲਿਖਿਆ ਨਾਲਿ ॥

By obeying His Will, as ordained by Him.

Guru Nanak makes a radical departure from the earlier Indian religious systems in expounding his concept of *Gurmukh*, the harbinger of *dharamsāl* on this earth. The *Gurmukh* promotes the *Nām* culture of *Sri Guru Granth Sahib*. In *Siddh Goshti*, Guru Nanak propounds and promulgates his concept of the ideal man, the *Gurmukh*. When the *Siddhas* asked the Guru to spell out the reasons of his wanderings (*Udāsīs*), the Guru gave an emphatic reply²²:

ਗੁਰਮੁਖਿ ਖੋਜਤੁ ਭਏ ਉਦਾਸੀ ॥

I am looking for a *Gurmukh* in the world.

The Guru knows that God created the earth, so that man can attain the emancipated state of a *Gurmukh*²³:

ਗੁਰਮੁਖਿ ਧਰਤੀ ਸਾਚੈ ਸਾਜੀ ॥ ਤਿਸ ਮਹਿ ਓਪਤਿ ਖਪਤਿ ਸੁ ਬਾਜੀ ॥

It is in the background of his spiritual experience and his concept of God, that Guru Nanak lays down the ground rules and methodology of his system.²⁴ The first corollary of it is that withdrawal, monasticism and asceticism are rejected, and instead, a householder's life is accepted. He condemns the yogis for "being idlers, and not being ashamed of begging alms at the very door of the householder whose life-style they spurn". He declares that liberation is possible even while enjoying bounties of life and that the Guru-oriented (*Gurmukh*) lives truthfully, even while being a householder. In *Siddh Goshti*, Guru Nanak gives a beautiful analogy²⁵ to explain his concept of a householder's life:

ਜੈਸੇ ਜਲ ਮਹਿ ਕਮਲੁ ਨਿਰਾਲਮੁ ਮੁਰਗਾਈ ਨੈ ਸਾਢੇ ॥

ਸੁਰਤਿ ਸਬਦਿ ਭਵ ਸਾਗਰੁ ਤਰੀਐ ਨਾਨਕ ਨਾਮੁ ਵਖਾਣੇ ॥

The life of a worldly man should be like that of a lotus in the lake, and that of a duck in the river, living in them and still unstained by their waters.

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Global Perspectives in Science and Sikh Religion

Abstract

Religion and Science are both engaged in the exploration of Ultimate reality following two different routes, viz; consciousness and material world. However, the quantum theory has broken the barrier between the two modes of perception by accepting the role of consciousness in both theory and experiment. The conflict between Science and Religion which started in Europe during 15th century is yielding place to an era of reconciliation and dialogue during recent times. Inter-faith dialogue and global perspectives of science-spirituality dialogue have an important role to play in this era of globalisation. Global perspectives in Science find an echo in the philosophy of Sikh religion. Our project will focus on Science-Spirituality dialogue with special reference to Sikh religion.

Introduction

Human life is based on the interaction of physical, cultural and even religious forms of life. Man is part of nature. Human mind has access to reality through four modes of knowledge: sensory experience, discursive cognition, intuition, and revelation. In the first two modes the subject-object duality remains intact. Hence the religious experience, which transcends this distinction, does not belong to the realm of these modes. While mysticism involves intuition, spiritualism bases its self-certifying validity on revelation. The revealed word has no

transcendental source, but is immanent in the cosmos and is revealed to and heard by the sages. This is how the Vedas were revealed as *shrutis*.

Religion and Science are both engaged in the exploration of Ultimate Reality. The field of religion concerns consciousness and its flux in molding the destiny of man. Science explores the nature or its manifestation through the material world. It starts from gross matter and moves toward subtle consciousness pervading in the material world. The modern science, namely, quantum mechanics has brought consciousness into the frame of reference of experimental and theoretical physics.

Retreat of Religion and Dominance of Science

The conflict between Science and Religion started after Renaissance in Europe. Both moral and intellectual revulsion against religion took place in the mind of the western man and his mental energies were diverted toward natural sciences. Diderot, in his *Encyclopaedia*, encouraged men to follow Natural Science in preference to Theology. Newtonian world-view gave birth to the mechanical philosophy of Nature and the Religion was dethroned from the realm of western man's life. Cartesian philosophy stressed that reality was knowable to man through senses and intuition; hence revelation and mysticism have no role to play. Reality was considered to be of material nature and spirituality was considered to be redundant. Deterministic materialism, as such, was held to be the ultimate paradigm of material reality. The Hegelian postulate that 'the real is rational, the rational real' implied another 'universal' which ignored spirituality and advocated historical materialism which led to advent of Marxism. Both these philosophies, viz., Cartesian dualism and Marxian socialism dethroned religion from the world-view of modern man till mid of twentieth century.

During the latter half of the 20th century, a crisis in this grand narrative of modern Western civilization has appeared. The myth of reason, rationality, progress and historical materialism exploded. The dialectic of class contradictions gave way to that of ethnic, ethno-religious and ethno-political

contradictions in the context of growing tensions between secular nationalism and religious nationalism. The technological inventions and the powers placed in the hands of the western man have been instrumental in giving him economic and political dominance over the eastern societies. The collapse of the grand narrative of modern western civilization is the collapse of the metanarrative of reason.

Science-Spirituality Dialogue

During the new millennium, the conflict between Science and Religion finds a retreat and we are living in a world where a dialogue between Science and Spirituality has become possible. Paradoxically, the inadequacy of reason has been revealed by reason itself. The Uncertainty Principle proposed by Werner Heisenberg has demolished the pyramid of deterministic philosophy based on Newtonian world-view. Here was an impasse beyond which reason could not go in its understanding of Reality. The knower and the known are being seen as intertwined, mutually inclusive and not mutually exclusive. It is being felt that the traditional (dualistic, atomistic, reductionist) view is incapable of revealing the essence of Reality. A new 'holistic' view is needed to see Reality in its concrete wholeness – a view that would see the whole in the parts and the parts in the whole, envisioned as dynamic becoming and not static being. This necessitates what is termed as "the paradigm shift" or the breakthrough of a new problematic in our thinking. This would not mean a negation of reason but going beyond it, to the realm of spirit. The notion of spirit in this sense would be the foundational principle of the global civilization of the third millennium analogous to the way in which 'reason' was the foundational postulate of the modern Western civilization after renaissance in Europe.

Post-Modern Era: An Age of Globalization

Due to a large number of technological advances in the post-modern era, the world is rapidly shrinking. Globalization has become the buzzword everywhere. Some profound changes

are taking place which are distinctly different from the modern era. Obviously, there is rethinking and reconfiguration of modern era ideologies causing many tensions, confusions and insecurities. Post-modern era can be described as an era of conflict and anxiety. For this shrinking and volatile world, there is a dire need of one universal religion. Inter-faith dialogue and global perspectives of science-spirituality dialogue have become of utmost importance in the post-modern era.

Post-modernism has questioned the empirical methods of the modern era to search for the absolute reality. It contends that ultimate reality can never be found through senses and scientific instruments. According to Lyotard, scientific and rationalist discourses of the modern era have lost their legitimacy during the post-modern times. Quantum physics and chaos theory are some prime examples to demonstrate that science cannot make reliable predictions. Truth and reality transcends the obvious.

Global Perspectives in Science and Sikh Religion

Recent advances in both experimental and theoretical physics have established that quantum theory supports the idea of a cosmic spirit pervading the cosmos and inter-relationship of individuals in world society (parts and wholes). Roger Penrose in his book, *Shadows of the Mind*, has tried to establish the role of consciousness in new physics which looks beyond quantum theory. In the chapter, 'Structure of the Quantum World', he probes the limitations of quantum theory to describe physical reality. Earlier, EPR paradox brought into focus the limitations of quantum theory: "The quantum-mechanical description of reality given by the wave function is not complete or, in other words, when the operators corresponding to two physical quantities do not commute, the two quantities cannot have simultaneous reality." EPR paradox was explained by John Bell in his famous theorem implying some hidden variables. Theoretical predictions of Bell's theorem have been verified by Aspect Experiments. The implications of Bell's theorem and its experimental findings are staggering. They have established the interplay of consciousness and the physical

world and changed our world-view where the notion of an objective world is in conflict with quantum theory. The inter-relation of human consciousness and the observed world is obvious in Bell's theorem. What we call physical reality, the external world, is shaped to some extent, by human thought. This train of thought was led further by David Bohm who proposed that the information of the entire universe is contained in each of its parts. For Bohm, order and unity are spread throughout the universe in a way which escapes our senses. We are living in a holographic universe. The world is an indivisible whole.

Similar sentiments were expressed by John Donne, a mystic poet, in his poem during 17th century : "No man is an island, entire of itself, everyman is a piece of the continent; if a clod is washed away by the sea, Europe is the less, any man's death diminishes me because I am involved in mankind."

Universal nature of scientific laws is well known, we have Lorentz invariance of physical laws of nature. Natural phenomenon is governed by four basic forces or interactions. Recent theories established the unification of basic forces which is confirmed by experiments. It is hoped that Grand Unification theories in Science may influence our thinking in cultural and religious domains also.

Global perspectives in Science find its echo in the philosophy of Sikh religion, founded by Guru Nanak during 15th century in India. It has some parallelism with renaissance and reformation movements in Europe. Guru Nanak challenged the orthodox ideas of Indian society based on Hinduism, Buddhism and Islam. Sikh philosophy as expounded in *Sri Guru Granth Sahib*, the Holy Book of the Sikhs, is unique in its epistemology. It rejects myths, rituals and dogma; as a consequence it has a universal appeal for humankind irrespective of its religious and cultural affiliations. In the holistic vision of Sikh philosophy, God, nature and man are integrally bound to each other. According to Rev. H L Bradshaw, "Sikh religion is a universal world faith, a message for all men. The religion preached by Guru Nanak is the faith of the New Age. The other religions contain the truth but the Sikh religion contains the fullness of truth."

Sikh religion is compatible with modern science in its approach to cosmology, nature of reality, relation of microcosm to macrocosm, and consciousness. Sikh religion believes in transcendental nature of reality as enunciated in SGGS: "In this realm, one sees but without the eyes; one listens but without the ears, one walks but without the feet; one works but without the hands; one speaks but without the tongue; thus attaining life in death. O Nanak, one meets the God after realisation of the divine law."

Sikh religion advocates dual nature of reality, transcendental and immanent. God himself transforms into creation, changing his *nirguṇa* form (energetic state) to *sarguṇa* form (material state). Space and time were created at the epoch of Big-Bang and creation process has occurred several times. The universe was created out of *sūnya* phase (cosmic void) billions of years ago. There are millions and billions of stars, solar systems and galaxies in the universe and it is difficult to account for the whole system.

Guru Nanak discards the Vedantic concept of reality which considers this universe as an illusion or *māyā*. The Sikh viewpoint is: "Real are Thy Continents; Real is the Universe; Real are these Forms and material objects; Thy doings are real, O Lord." Truth is considered supreme in all religions but the Sikh religion lays more stress on truthful living than on truth: "Truth is high but higher still is truthful living." Hence the Sikh religion does not condemn the worldly life as *māyā* (illusion). Reality is perceived in a holistic mode in both microcosm and macrocosm. Guru Nanak has identified the manifest reality with nature: "Nanak, the beneficent Lord alone is true, and He is revealed through His Nature."

The need of the hour is a dialogue between Science and Spirituality. It will be most appropriate to promote Global Perspectives of Science and Spirituality with special reference to the Sikh religion.

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Sikh Religion and Christianity: An Interfaith Dialogue

Introduction

To achieve the objective of inter-faith dialogue in the present day world, it is imperative to study the holy books or scriptures of different religious traditions. Unless we find some common basic principles propounded in the holy books there can be no meeting point for an interfaith dialogue which can ultimately lead to world peace. During the twenty-first century, unification ideas in science, globalization in world economy, holistic vision of reality and science – religion dialogue are expected to bring about a paradigm shift in the human behaviour.

Sikhism and Christianity belong to two different religious traditions, commonly known as Oriental and Occidental or Semitic, respectively. Both are also separated historically by a gap of fifteen centuries. Guru Nanak was the founder of Sikh religion in India while Jesus Christ founded the Christianity in Palestine. Both the prophets have been considered as crusaders against the established religious traditions of their country of origin. While Guru Nanak started his campaign against the established social, religious and political system in India, Jesus did the same in Palestine. Guru Nanak was fighting against the Brahmanical traditions of Hindu society in India during the 15th century. Jesus Christ had to fight against the Jewish traditions of Palestine and Christians earned the wrath of Roman Empire for more than three hundred years. Sikh Gurus and their

followers had to suffer at the hands of Mughal emperors for almost three hundred years.

Both Sikhism and Christianity have another common feature: they are religions of the book. The religious book of the Christians is called "The Bible". It consists of two parts: (a) *The Old Testament* – a covenant between man and the God of the Jews (Jehovah), and (b) *The New Testament* – a collection of biographical sketches of Jesus and an interpretation of his philosophy as understood by his disciples. The sixty-six books of the present Bible were written by no less than forty writers over a period of two centuries. Jesus himself did not leave even a single line in writing nor did he instruct anyone to do so. The holy book of Sikh religion, *SGGS*, was compiled by Guru Arjan Dev, the fifth Nanak, in 1604. It has compositions of Sikh Gurus and the sacred writings of various Hindu and Muslim saints of India. The authentic version of *SGGS* compiled by Guru Arjan Dev was enshrined and declared as 'Sabda Guru' of the Sikhs in 1708 by Guru Gobind Singh, the tenth Nanak. *SGGS* does not contain history or biographies of the Sikh Gurus except for some indirect references here and there. It is written in verse and is meant for singing following the rich tradition of Indian ragas.

The Sikh tradition of Inter-faith dialogue originated with Guru Nanak, the first prophet of Sikh religion, who made it a mission of his life to visit holy places of other religious sects in India and abroad. Guru Nanak travelled far and wide in all four directions and held discourses with Hindu saints, Muslim peers and *Nath-yogis*. The essence of these discourses is recorded in *SGGS* and the famous composition known as *Sidh-Goshti* refers to one such remarkable debate with *Nath-yogis*. However, there is no evidence of any discourse with followers of Christianity in *SGGS*.

Inter-Comparison of Sikh Scripture and the Holy Bible

It is quite but natural that the two belief systems, Sikhism and Christianity, which were separated in both time and space, may have some common doctrines as well as widely different

approaches to epistemological concepts, viz., origin of the universe, nature of reality, the relation between soul of man and his body, and concept of liberation. For sake of comparison, we discuss some basic concepts in both Sikhism and Christianity to appreciate the viewpoints about such fundamental questions: What is God? How the Universe was created? What are the Ideal Man and his role in Society? What are Heaven, Hell and Grace of God?

Concept of God

The Sikh concept of ultimate Reality or God is more akin to the Judaic notion of an Almighty person than to the Aryan concept of an immanent neutral principle.¹ In the opening stanza of *SGGS*, Ultimate Reality is defined as: One (Being – Becoming), Truth and Existence, Creator Person, without Fear or Hatred, Beyond Time and Space, Self-Existent, Transcendental Cosmic Spirit made manifest by the Grace of the Guru.

The basic Sikh thought is strictly monistic² and there is no room for demi-gods and goddesses as in Hinduism:

ਇਕਸੁ ਤੇ ਹੋਇਓ ਅਨੰਤਾ, ਨਾਨਕ ਏਕਸੁ ਮਾਹਿ ਸਮਾਏ ਜੀਉ ॥

From One the many emanate and finally,
O, Nanak into the One the many submerge.

The main doctrines of Sikh theology are based on this view of Ultimate Reality. Reality or God was in existence before the creation of Universe. The Sikh philosophy dialectically unites the ideas of God and the world. Transcendence shows that God is prior to and distinct from the world. Immanence of God represents God's connection with the world. In a manner of speaking, God is one but has dual nature, Transcendental and Immanent. Guru Nanak has identified the manifest reality with Nature³:

ਨਾਨਕ ਸਚ ਦਾਤਾਰੁ ਸਿਨਾਖਤੁ ਕੁਦਰਤੀ ॥

Nanak, the beneficent Lord alone is True, and
He is revealed through his Nature.

Concept of God is central to Christianity and the first commandment is, "The Lord our God is One." Christians call

Jesus, the only 'Son of God'⁴: "God so loved the world that he sacrificed his only begotten son for it." However, Jesus⁵ himself says that he was the 'Son of Man'. The Bible⁶ even calls common people 'sons and daughters' of God.

We find an echo of this concept in *SGGS*. According to the Sikh belief all human beings are sons and daughters of God⁷:

ਤੂੰ ਮੇਰਾ ਪਿਤਾ ਤੂੰ ਹੈ ਮੇਰਾ ਮਾਤਾ ॥

O God, you are my Father and you are my Mother.

Bhagat Kabir also calls himself son of God in *SGGS*⁸:

ਹਉ ਪੁਤੁ ਤੇਰਾ ਤੂੰ ਬਾਪੁ ਮੇਰਾ ॥ ਏਕੈ ਠਾਹਰ ਦੁਹਾ ਬਸੇਰਾ ॥

I am your son and you are my Father, We both live together.

A similar sentiment is expressed by Jesus to establish his relationship with God⁹: "I came down from heaven. I and my Father are one. I will come again to receive you unto myself."

Christians believe that Christ will be their saviour on Doomsday. Sikhs do not believe in any such dogma. In contrast, Sikhism believes in the salvation of all through God's grace irrespective of their religious affiliations¹⁰:

ਜਗਤੁ ਜਲੰਦਾ ਰਖਿ ਲੈ ਆਪਣੀ ਕਿਰਪਾ ਧਾਰਿ ॥

ਜਿਤੁ ਦੁਆਰੇ ਉਥਰੈ ਤਿਤੇ ਲੈਹੁ ਉਥਾਰਿ ॥

O God this world is burning in its own sins,

Save it in Thy Mercy. It matters not

Which way (religious path) they approach You.

Creation of the Universe (Genesis)

The holy Bible states,¹¹ "In the beginning God created heaven and earth... Let there be light.... Let there be a firmament... Let the waters bring forth life. And the evening and morning were created the sixth day. He rested on the seventh day and blessed and sanctified it."

The Genesis story of the Bible has been challenged by physicists, biologists and geologists on the basis of scientific findings which contradict this hypothesis. For example,

according to this scheme, the earth existed before the sun and the stars. The days existed before the sun came into existence. In fact, the whole scheme looks topsy-turvy in modern scientific terms.

According to Sikh Cosmology, God existed before creation in *sūnya* (void) phase. Then He willed the creation of the universe and the process began as follows¹²:

ਸਾਚੇ ਤੇ ਪਵਨਾ ਭਇਆ ਪਵਨੈ ਤੇ ਜਲੁ ਹੋਇ ॥

ਜਲ ਤੇ ਤ੍ਰਿਭਵਣੁ ਸਾਜਿਆ ਘਟਿ ਘਟਿ ਜੋਤਿ ਸਮੋਇ ॥

The Lord created air (gases) which combined to form water.

The water brought forth the creation with the Lord Himself as the spark of life in it.

The Sikh scripture (SGGS) unfolds the Genesis story in a most scientific manner. As for the time of creation, it is known to God alone. There are millions of galaxies with millions of suns, moons and planets in the Universe. Man can never know the extent of God's creation which has occurred several times¹³:

ਕਈ ਕੋਟਿ ਖਾਣੀ ਅਰੁ ਖੰਡ ॥ ਕਈ ਕੋਟਿ ਅਕਾਸ ਬ੍ਰਹਮੰਡ ॥...

ਕਈ ਬਾਰ ਪਸਰਿਓ ਪਾਸਾਰ ॥ ਸਦਾ ਸਦਾ ਇਹੁ ਏਕੰਕਾਰ ॥

There are millions and millions of galaxies and solar systems in the Universe.

The creation has occurred so many times,
But the one Lord remains for ever and ever.

One of the most beautiful hymns in SGGS is the 'Hymn on the Cosmology' which runs as follows¹⁴:

ਅਰਬਦ ਨਰਬਦ ਪ੍ਰਧੁਕਾਰਾ ॥ ਧਰਣਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ ॥

ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ ॥...

For billions of years, there was nothing but utter darkness. There was neither day nor night, nor moon, nor sun but the Lord alone sat in profound trance...

When He so willed, He created the world and supported the firmament without support. He founded the continents, solar systems and underworlds, and from the Absolute self, He became manifest.

Concept of Salvation, Heaven and Hell

According to Christian belief, salvation is possible only through Christ. His spirit will escort all Christians to God's presence. The holy *Bible* claims¹⁵:

There is only one intermediary among God's men who has paid the price for everybody's salvation.

There is no salvation through anyone else; in all the world no other name has been granted to mankind by which we can be saved.

Sikhism does not claim monopoly of salvation nor does it believe in salvation that supposedly comes after death. SGGS advocates salvation during this life itself. By following the Sikh way of life, one can attain to the state of *jīvan-mukta* (liberated while living)¹⁶:

ਜਿਸੁ ਨਾਮੁ ਰਿਦੈ ਸੋ ਜੀਵਨ ਮੁਕਤਾ ॥

Christianity does not look for the immortality of a soul but the resurrection of the complete person in a new and wonderful body. Those who are saved by Christ will go to heaven and those not saved will suffer punishment in hell. Christians are already saved because they already have forgiveness and new life promised by Jesus Christ.¹⁷

Sikhism believes that man's soul is immortal because it is part and parcel of God but is separated from Him due to ego. Guru-oriented Sikhs (*gurmukhs*) are liberated during this life before physical death while *manmukhs* (ego-oriented) suffer during this life and life hereafter. Heaven and Hell have different connotations in Sikh vocabulary. The idea of a Heaven in the skies and Hell in the bowels of earth is not recognized in Sikhism. This world can become a heaven for a *gurmukh* and a hell for *manmukh*. Heaven and hell refer to the states of mind of an individual and not some physical spaces.

Ethics and Morality

The Sikhs pay great respect to their holy book (SGGS), wash their bodies, cover their heads and take off their shoes when they pray to God. It is interesting to note that in the past

the Christians¹⁸ also conducted their religious services like the Sikhs do today.

In *Bible*¹⁹ Jesus says, "Thy will be done in earth, as it is in heaven." In *SGGS*,²⁰ it is called *hukam* or divine Will which cannot, however, be explained:

ਹੁਕਮੀ ਹੋਵਨਿ ਆਕਾਰ, ਹੁਕਮੁ ਨ ਕਹਿਆ ਜਾਈ ॥

By His Will, creation takes place
but His Will is indescribable.

Jesus says that there are two commandments²¹: "Love thy God with all thy heart, soul, mind and body; and love thy neighbour as thyself." Guru Gobind Singh puts it as a pre-condition for God-realisation²²:

ਸਾਚੁ ਕਹੋਂ ਸੁਨ ਲੇਹੁ ਸਬੈ ਜਿਨ ਪ੍ਰੇਮ ਕੀਓ ਤਿਨ ਹੀ ਪ੍ਰਭ ਪਾਇਓ ॥

I proclaim the Truth, listen ye all.
Only those who Love have realised God.

Sikh Gurus realised the power of Love and the price has to be paid by total submission to God or Guru, the preceptor. In *SGGS*, Guru Nanak lays down the stringent condition for the dedicated disciple²³:

ਜਉ ਤਉ ਪ੍ਰੇਮ ਖੇਲਣ ਕਾ ਚਾਉ ॥

ਸਿਰੁ ਧਰਿ ਤਲੀ ਗਲੀ ਮੇਰੀ ਆਉ ॥

If you want to play the game of Love,
Come into my street with your head on thy palm.

The Bible lays stress on purity of heart²⁴: "Cleanliness of body is of no avail but purity of heart." In *SGGS*, the same sentiment is expressed as follows²⁵:

ਤੀਰਥ ਨਾਤਾ ਕਿਆ ਕਰੇ ਮਨ ਮਹਿ ਮੈਲੁ ਗੁਮਾਨੁ ॥

What is the use of bathing at places of pilgrimage?
When your mind is full of filth due to stubborn pride.

Idolatry was condemned by Jesus in strongest terms and the *Bible* supports this view-point²⁶: "My dearly beloved, flee from idolatry."

All the Sikh Gurus condemned idolatry in their sermons, a clear divergence from the Hindu religion. Sikh Gurus advocated the efficacy of meditation, congregational prayers,

chorus singing of hymns for God-realization and rejected the rituals and idol-worship. In fact, Guru Nanak very clearly stated in *SGGS*²⁷ that the *Sabda*, not the physical body, is the Guru :

ਸਬਦੁ ਗੁਰੂ ਸੁਰਤਿ ਹੁਨਿ ਚੇਲਾ ॥

The Word (*sabda*) is my Guru and consciousness is the disciple.

It is interesting to remark that the manifestation of spiritual acts is commended in the *Bible* while works of flesh, viz., adultery, lasciviousness, hatred, drunkenness and vain glory are condemned in no uncertain terms. *SGGS* speaks in identical tones and forbids coming under the influence of five evils, namely, lust, anger, greed, attachment, and pride (*kām*, *krodh*, *lobh*, *moh* and *ahaṅkāra*).

I was amused to read the contradictory statements of *Bible* regarding meat eating and drinking of wine²⁸:

Drink no longer water but use a little wine for thy stomach's sake and thine often infirmities.

It is good neither to eat flesh, nor to drink wine, nor anything whereby thy brother stumbleth, or is offended, or is made weak.

Intoxicants are forbidden in Sikh religion but meat eating is part of Sikh code of conduct (*Rehat Maryada*). Ideas about meat eating and drinking are almost identical in *Bible* and *SGGS*.

Jesus said²⁹: "Render unto Caesar the things which be Caesar's and unto God the things which be God's." Thus, the spiritual and the political life were separated into two different domains.

The Sikh Gurus, on the other hand, recognized God as the True ruler. In Sikhism, both spiritual and political activity is sanctioned and the concept of *mūrī* and *pīrī* forms the basis of Sikh ethics. However, Guru Gobind Singh³⁰ has also recognized the two domains as distinct as in the *Bible*. He states:

ਬਾਬੇ ਕੇ ਬਾਬਰ ਕੇ ਦੋਹੂ ॥ ਆਪ ਕਰੇ ਪਰਮੇਸਰ ਸੋਊ ॥

ਦੀਨ ਸਾਹ ਇਨ ਕੋ ਪਹਿਚਾਨੋ ॥ ਦੁਨੀ ਪਾਤਿ ਉਨ ਕੋ ਅਨੁਮਾਨੋ ॥

Both Guru Nanak and Emperor Babur were created by the same God. The House of Nanak is recognized as spiritual

and the House of Babur as political for all intents and purposes.

The concepts of Word in the Bible and *Sabda* in the *SGGS* are almost compatible and have a far reaching import in the creation process. According to *Bible*³¹: "In the beginning was the Word, and the Word was with God, and the Word was God. Through him all things were made." The explicit functions of the Word are Creation, Revelation and Salvation.³² *SGGS* also implies that *Sabda* (Word) is the vehicle for all creative activity of God, promotes understanding of God, and union with God is possible by meditation on *Sabda*³³:

ਉਤਪਤਿ ਪਰਲਉ ਸਬਦੇ ਹੋਵੈ ॥
ਸਬਦੇ ਹੀ ਫਿਰਿ ਓਪਤਿ ਹੋਵੈ ॥

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Sikh Religion and Islam: An Interfaith Dialogue

Introduction

Sikhism, as one of the youngest religions in the world, was born in Punjab (India) and Guru Nanak was the founder of Sikh religion. Islam was born as a new faith in Arabia during the 7th Century and Prophet Muhammad was its founder. Guru Nanak realised the suffering of Indian people under the yoke of dual oppression by Brahminic and Islamic priestly classes on the one hand and the contemporary rulers, on the other. Guru Nanak refers to the state of affairs in his compositions recorded in *Sri Guru Granth Sahib (SGGS)* as follows¹:

ਰਾਜੇ ਸੀਹ ਮੁਕਦਮ ਕੁਤੇ ॥ ਜਾਇ ਜਗਾਇਨ੍ਹਿ ਬੈਠੇ ਸੁਤੇ ॥

Rajas were ruthless like tigers and the priestly judges were like dogs, and their officials swooped down on people regardless of whether they were sitting or sleeping (i.e., at any time of the day).

Prophet Muhammad found the Arabian people divided into hundreds of tribes engaged in internecine warfare. The people were superstitious and believed in idol-worship, magic, astrology and cult practices. Gambling and drinking were very common and taking revenge was considered a religious duty. Slavery was common and female child was killed or buried alive. There was hardly any literacy among the Arabs.

Sikhism and Islam, though separated widely in both time and space, have many common features and similarities.² A

comparison of texts of *SGGS* and the holy *Quran* will reveal many points of similarity and some other issues on which both religions also differ. The aim of this essay is not to establish the superiority of one over the other but to provide a common platform for an inter-faith dialogue between Sikh religion and Islam. For example, both religions believe in the Oneness of God and are against idol-worship in any form. Belief in the will of God, meditation on the Name of the God and congregational prayer are central to both religions. The caste system in the society is rejected by both and all human beings are considered equal in the eyes of God and Prophet. Spiritual and temporal attainments are considered as sacred goals for upliftment of society in both the religions.

Inter-faith dialogue³ does not mean encounter among variant religious traditions but is a sort of interaction confined not only to religious issues but also pertaining to social and cultural problems. This type of dialogue issues forth in a spirit of fellowship and recognizes the whole in each part. Inter-faith dialogue does not mean denial of the identity of individual traditions through a synthesis of different approaches. The cosmopolitan vision of Guru Nanak is also evident in his inter-faith dialogues with the different religious traditions of his time. Guru Nanak, no doubt, offered a critical analysis of the contemporary religious thought and rejected their external paraphernalia but only to inculcate in them a spirit of deeper penetration in their own religion. The aim of interfaith dialogue in his hymns in *SGGS* is neither subjugation, nor domination, nor conversion, nor degradation of other traditions but to make them visualize the kernel of truth and implement it in their lives for spiritual transformation⁴⁻⁵:

ਸੋ ਬ੍ਰਹਮਣੁ ਜੋ ਬਿੰਦੈ ਬ੍ਰਹਮੁ ॥ ਜਪੁ ਤਪੁ ਸੰਜਮੁ ਕਮਾਵੈ ਕਰਮੁ ॥

ਸੀਲ ਸੰਤੋਖ ਕਾ ਰਖੈ ਧਰਮੁ ॥ ਬੰਧਨ ਤੋੜੈ ਹੋਵੈ ਮੁਕਤੁ ॥

ਸੋਈ ਬ੍ਰਹਮਣੁ ਪੂਜਣ ਜੁਗਤੁ ॥

ਖੜ੍ਹੀ ਸੋ ਜੁ ਕਰਮਾ ਕਾ ਸੂਰੁ ॥ ਪੁੰਨ ਦਾਨ ਕਾ ਕਰੇ ਸਰੀਰੁ ॥

ਖੇਤੁ ਪਛਾਣੈ ਬੀਜੈ ਦਾਨੁ ॥ ਸੋ ਖੜ੍ਹੀ ਦਰਗਹ ਪਰਵਾਣੁ ॥

The real *Brahmin* is only he who practices austerity, contemplation, self-control, righteous deeds and is contented and cultured. A real *Khatri* is he who performs

heroic deeds, who is compassionate, charitable and beneficent.

ਮਿਹਰ ਮਸੀਤਿ ਸਿਦਕੁ ਮੁਸਲਾ ਹਕੁ ਹਲਾਲੁ ਕੁਰਾਣੁ ॥

ਸਰਮੁ ਸੁੰਨਤਿ ਸੀਲੁ ਰੋਜਾ ਹੋਹੁ ਮੁਸਲਮਾਣੁ ॥

A true *Muslim* is he who makes mercy as his mosque, faith as prayer mat, honest living as *Quran*, humility as circumcision and good conduct as fast.

Concept of God

The concept of God has much in common in both Sikhism and Islam. God is considered omnipotent, omniscient, creator of universe and unborn in both religions. Guru Nanak defined God in the opening verse⁶ (*mūlmantra*) of *SGGS* as follows:

**ੴ ਸਤਿ ਨਾਮੁ ਕਰਤਾ ਪੁਰਖੁ ਨਿਰਭਉ ਨਿਰਵੈਰੁ ਅਕਾਲ ਮੂਰਤਿ ਅਜੂਨੀ ਸੈਭੰ
ਗੁਰ ਪ੍ਰਸਾਦਿ ॥**

Ik Onkār (God is One), *Sat Nām* (His name is True), *Kartā Purkh* (He is the Creator), *Nirbhau* (He is without fear), *Nirvair* (He is without enmity), *Akāl Mūrat* (He is timeless Being), *Ajonī* (He is beyond births and deaths), *Saibhaṅg* (He is self-created), *Gurprasād* (He is realized by the grace of the Guru).

The oneness of God is repeatedly stressed in *SGGS* by all the Sikh Gurus⁷⁻⁹:

ਸਾਹਿਬੁ ਮੇਰਾ ਏਕੋ ਹੈ ॥ ਏਕੋ ਹੈ ਭਾਈ ਏਕੋ ਹੈ ॥

My Lord is One, One and the only One O, Brother.

ਤੂੰ ਜਗੁ ਜਗੁ ਏਕੋ ਸਦਾ ਸਦਾ ਤੂੰ ਏਕੋ ਜੀ ਤੂੰ ਨਿਰਭਲੁ ਕਰਤਾ ਸੋਈ ॥

Age after age, You are the One,
Forever and ever, You are the One,
You never change, O creator Lord.

ਸਭ ਮਹਿ ਇਕੁ ਵਰਤਦਾ ਏਕੋ ਰਹਿਆ ਸਮਾਇ ॥

The One Lord permeates all,
The One Lord is pervading everywhere.

Sikh religion is very liberal in calling God by various names selected both from Hindu and Muslim traditions; for

example, Hari, Ram, Allah and Khuda. Guru Gobind Singh¹⁰ refers to naming of God in one of his verses:

ਤਵ ਸਰਬ ਨਾਮ ਕਥੈ ਕਵਨ ਕਰਮ ਨਾਮ ਬਰਨਤ ਸੁਮਤਿ ॥

Who can say all His Names?

He is described only by those of His qualities,
Which are manifest through His creation.

God is considered *Nirvair* in Sikh religion, which means He is inimical to none. In Islam, God is merciful to the believers only and cruel to the infidels (*Kāfirs*). However, Oneness of God is the cardinal principle in Islam¹¹:

La Ilaha, ill-Allah

There is no god but God.

Sikhism believes in One God who is both Transcendent and Immanent. He is manifested in this universe through His creation. Oneness of God is common aspect of both Sikhism and Islam.

God is not involved in cycle of birth and death and is beyond the confines of space and time. He is a self-created Being. This idea is common to both Sikhism and Islam. Holy *Quran*¹² records this quality as follows:

Lam yalid wa Lam yoolad

He is neither the begetter nor the begotten.
All things are mortal except Him.

In *SGGS*,¹³⁻¹⁵ this aspect is highlighted in many verses as follows:

ਜਨਮ ਮਰਣ ਤੇ ਰਹਤ ਨਾਚਾਇਣ ॥

God is devoid of birth and death.

ਨਾ ਤਿਸੁ ਮਾਤ ਪਿਤਾ ਸੁਤ ਬੰਧ ਨਾ ਤਿਸੁ ਕਾਮੁ ਨ ਨਾਚੀ ॥

God is without parents, progeny and wife.

ਤੂੰ ਪਾਰਬ੍ਰਹਮੁ ਪਰਮੇਸਰੁ ਜੋਨਿ ਨ ਆਵਹੀ ॥

You are Lord of all and need not enter the womb.

God is Omniscient and this similarity is found in the verses of Holy *Quran*¹⁶ and *SGGS*¹⁷:

Quran: "Even if thou speakest aloud, He knows the secret thought and that which is yet more hidden."

SGGS: ਆਪੇ ਜਾਣੈ ਕਰੇ ਆਪਿ ਆਪੇ ਆਣੈ ਰਾਸਿ॥

He himself knows, He Himself acts and sets things right.

Creation of the Universe

A comparison of cosmological ideas in *SGGS* and *Quran* is already given in Chapter 2, "Cosmological Ideas in Science and Religion." We need not repeat all those ideas here. Islamic theory of creation is almost identical to the one given as Genesis in the holy *Bible*. The Sikh cosmology is more scientific in its approach but leaves the act of creation in the hands of God as the Creator (*Kartā Purkh*). Islam also accepts this idea and the role of God as the creator.

Concept of Salvation, Heaven and Hell

Life and death are two concrete realities and both Sikhism and Islam deal with salvation, a riddance from the cycle of birth and death, in their own way following the Oriental and Occidental traditions, respectively. Sikhism is a life-affirming religion and advances the hypothesis of liberation during this life itself (*Jeevan Mukti*). Death need not be a painful experience for a Guru-oriented (*gurmukh*) person, rather a blessing in disguise. The ego-oriented (*manmukh*) suffers the pangs of death. Bhagat Kabir¹⁸ illustrates the Sikh view-point in *SGGS* as follows:

ਕਬੀਰ ਜਿਸੁ ਮਰਨੇ ਤੇ ਜਗੁ ਡਰੈ ਮੇਰੇ ਮਨਿ ਆਨੰਦੁ॥

ਮਰਨੇ ਹੀ ਤੇ ਪਾਈਐ ਪੂਰਨੁ ਪਰਮਾਨੰਦੁ॥

Kabir, death, which frightens the world,
is the harbinger of bliss for me.

Because it is after death,
I will meet my God.

Heaven and hell do find a mention in *SGGS* but the concept of Doomsday is ignored. Sikh religion does not attach too much importance to the disposal of a dead body. It can be cremated or disposed of in a running stream of water. However, the Muslims bury their dead and consider the act of cremation

as a sacrilege. Like Christianity, Islam believes in Doomsday, when the dead will rise again from the graves¹⁹:

And because the hour will come, there is no doubt thereof,
and because Allah will raise those who are in the graves.

Muslims believe that there is eternal life or eternal damnation after death. On the Doomsday, the day of the last Judgement, Prophet Muhammad will intercede on behalf of the Muslims. He will deliver the God-fearing into heaven (*ja'nnat*) and the wrong-doers into hell (*dozakh*). Those who enter heaven will live in beautiful gardens surrounded by rivers of milk and honey. They will enjoy company of women of exquisite beauty (*hoorān*). The depiction of hell is like an inferno, horrible to describe here in greater detail.

Ethics and Morality

Perhaps, Islam is the only religion where moral laws are part and parcel of its holy book, the *Quran*. Islamic code consists of *shariat* and *fiqah*; *shariat* deals with moral code of conduct and *fiqah* is the science of jurisprudence (Islamic law). Some of the Islamic nations follow the moral code of conduct in letter and spirit in running the affairs of their government but the others follow it partially. Prophet Muhammad wanted to implement the moral code of conduct in Muslim society to keep it on right track. Some of the clauses of *fiqah* look quite harsh in the face of modern jurisprudence. For example, adultery is punishable by death and theft²⁰ by cutting of hands:

As for the thief, both male and female cut off their hands.
It is the reward of their own deeds and exemplary
punishment from Allah.

There is no such rigid code of conduct prescribed in the SGGS. However, to regulate the religious affairs of the Sikh society, SGPC (the Sikh religious body) adopted *rehat maryādā* (code of conduct), which is quite flexible compared to the *shariat* of Islam. Jurisprudence and administration of justice is left to the local courts and not to the religious authority in Sikhism. The reason for this approach may be attributed to the concept of evil and sin in Sikh religion and Islam. Evil is

personified by *Satan* in Islam²¹: "We assign unto him a devil who would be his mate," while Sikhism does not accept the existence of any anti-God entity.

In Sikhism, evil results from the imbalance between worldly and spiritual pursuits. SGGS advocates a truthful conduct,²² a balanced approach in life and prayer to God to avoid falling a prey to the evil:

ਸਚਹੁ ਚਿਰੈ ਸਭੁ ਕੋ ਉਪਰਿ ਸਚੁ ਆਚਾਰੁ ॥

The division into saints and sinners is justified by their actions during the life. "To err is human" is the acceptable norm in Sikh religion. Only God is perfect; all human beings are liable to commit mistakes²³⁻²⁴:

ਭੁਲਣ ਅੰਦਰਿ ਸਭੁ ਕੋ ਅਭੁਲੁ ਗੁਰੁ ਕਰਤਾਰੁ ॥

All are apt to make mistakes, only
God (the Creator) is infallible.

ਭੁਲਣ ਵਿਚ ਕੀਆ ਸਭੁ ਕੋਈ ਕਰਤਾ ਆਪਿ ਨ ਭੁਲੈ ॥

All things created are susceptible to error,
Only the Creator errors not.

Sikhism and Islam both support the family life of its adherents; with due respect for parents and elders. However, there is a wide gap in both religions so far as respect of women is concerned. In Sikh religion, the status of women is equal to men in all respects and numerous verses in SGGS glorify the role of women in society²⁵:

ਸੋ ਕਿਉ ਮੰਦਾ ਆਖੀਐ ਜਿਤੁ ਜੰਮਹਿ ਰਾਜਾਨ ॥

Islam assigns different roles and responsibilities for men and women. Polygamy is permissible and allows upto four women in Islam. Muslim women are required to keep their bodies fully covered wearing a *Burqa* or *Hijab*. They are not allowed to join their men folk in prayers conducted in the mosque. Their status is almost equal to slaves²⁶: "Men are in charge of women because Allah hath made the one to excel the other."

Charity is highly recommended in both religions. Sikh Gurus commended the contribution of tithe (*daswandh*, equal to 10 percent of income) for the promotion of social and

spiritual upliftment of the society. SGGS lays stress on honest earning and sharing the fruits of labour even for spiritual emancipation of the individual²⁷:

ਘਾਲਿ ਖਾਇ ਕਿਛੁ ਹਥਹੁ ਦੇਇ ॥ ਨਾਨਕ ਰਾਹੁ ਪਛਾਣਹਿ ਸੋਇ ॥

He who earns his livelihood by honest means,
and shares it with others, has found the true path.

Prophet Muhammad recommends charity as a great virtue in Islam: "Even half a date-fruit given in charity can save a person from hell-fire". Charity is collected in the form of *Zakāt* by the government and it is responsible for its distribution among deserving poor people of the country.

After discussion of common aspects of both religions, we may refer to some minor points of difference in their creeds. Slavery is permitted in Islam but it is not condoned in any form in Sikh religion. Islam does not approve of music and dancing and considers both as *haram* (forbidden). However, the Sikh scripture is written in poetry and *ragas* and its congregational singing (*Kīrtan*) is considered the best form of worship in Sikh religion²⁸:

ਕਲਜੁਗ ਮਹਿ ਕੀਰਤਨੁ ਪਰਧਾਨਾ ॥

ਗੁਰਮੁਖਿ ਜਪੀਐ ਲਾਇ ਧਿਆਨਾ ॥

In this Dark Age of *Kaliyug*,
Singing of Lord's praises (*Kīrtan*) is the
Most sublime and exalted mode of meditation.

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Sikh Religion and Hinduism: An Interfaith Dialogue

Introduction

It is believed that Inter-faith dialogue will help the whole world to live in peace and harmony. There were conflicts and wars due to misunderstandings or misinterpretations of scriptures of other religions. The pioneer assembly to bring the religious leaders of the world together in a spirit of reconciliation was held in Chicago during 1893 under the banner of world Parliament of Religions. Swami Vivekananda participated in this assembly to represent Hindu religion.

Interfaith dialogue and religious pluralism are more relevant in the Indian context due to diversity of religions, languages and cultures. The first prophetic message of Guru Nanak after communion with God: "There is no Hindu no Musalman", emphasized the universal human spirit revealed for the first time in the history of world religions. Guru Gobind Singh repeated the message of Guru Nanak when he proclaimed that all humanity is one in spirit¹:

ਮਾਨਸ ਕੀ ਜਾਤ ਸਭੈ ਏਕੋ ਪਹਿਚਾਨਥੋ ॥

Sikh religion is universal in its approach as reflected in the teachings of SGGS. Acceptance of religious pluralism and tolerance is the hallmark in the lives of Sikh Gurus and Sikh tradition in general. Guru Nanak was revered by the people of all Indian creeds as is evident from the phrase: "*Guru Nanak Shāh faqīr, Hindu kā Guru, Musalmān ka Pīr.*" It is recorded in Janamsakhi that both Hindus and Muslims laid claim to the

body of Guru on his death in Kartarpur. *Sri Guru Granth Sahib's* essential concerns are for the whole humanity and Gurbani proclaims²:

ਬਾਣੀ ਪ੍ਰਭ ਕੀ ਸਭੁ ਕੋ ਬੋਲੈ ॥

The *bani* of God's word is spoken by everyone.

According to Teja Singh³: "The holy Granth (SGGS) is the only inter-communal book in India, if not in the world." SGGS contains the verses of 36 contributors belonging to different parts of India and representing almost all cross-sections of medieval Indian society. Bhai Mardana, a Muslim, was a life-long companion of Guru Nanak. He never distinguished between Hindus and Muslims. When Guru Nanak was questioned in Baghdad about the superiority of Hindus or Muslims, his emphatic reply⁴ was:

ਸੁਭਿ ਅਮਲਾ ਬਾਝਹੁ ਦੋਨੋ ਰੋਈ ॥

Without good deeds both will suffer.

It is unfortunate that the message of Sikh Gurus has been unconsciously or deliberately misinterpreted by both Indian and foreign scholars due to the theological language of the Hindus used in SGGS. When Sikhism came to Punjab, Brahminism interpreted it as its off-spring with a view to holding it in its tentacles.⁵ According to Puran Singh⁶: "Hinduism was once intolerant to Buddhism; it is now intolerant to Sikhism because it threatens to change Hinduism vitally."

Contemporary Sikhism is becoming intensely aware of its ethno-religious, ethno-social, ethno-cultural, and ethno-political identity and corporate personality. Sikhism has to re-define its relatedness to Hinduism, as distinct from the earlier stress on rootedness in Hinduism. Sikh religion, despite its doctrinal newness and distinct identity, shares with the Indian commonwealth of religions certain recurring ideational archetypes that have shaped different cultures and civilizations arising in the Indian sub-continent.⁷

In my view, we have four categories of scholars commenting on the contribution of Sikh Gurus to Indian society. In the first category, one can include scholars who treat

Sikhism as a Hindu reformist movement. In the second category, we can include scholars who treat Sikhism as a synthesis of Hinduism and Islam. There is a third category which considers Sikhism as a branch of *Bhakti* movement only. A new breed of Sikh scholars considers Sikhism as a unique religion with no link to Hinduism or Islam. There is lot of confusion in Sikh Studies due to these different approaches.

Our approach in this essay will be to establish the unique identity of Sikh religion and to explore its relationship with the mainstream Hinduism on the basis of some essential elements common to both the traditions. The unique character of Sikh religion is confirmed by the observation made by Prof. M. Mujeeb,⁸ an eminent scholar of Aligarh Muslim University: "Guru Nanak was not a mere reformer. We know he was not a Hindu who appealed to the Hindu scriptures in order to reform Hindu society. We know he was not a Muslim trying to eradicate evils in Muslim society by appealing to the *Quran*. I do not find in his teachings any attempt at a reconciliation of Hinduism and Islam. In fact, he set both Hinduism and Islam aside to get to the source of religion itself. He was an originator, a founder."

The reason for misunderstanding Guru Nanak's message lies in the use of terms and concepts in his *bani* according to Grewal⁹: "The impression that Guru Nanak's religious ideas present a good deal of similarity to the ideas which one can easily discover in contemporary Islam and Hinduism has a strong basis in the terms and concepts used by Guru Nanak in his compositions; but this impression is quite misleading. In the context of his theological thought, current terms and concepts undergo a significant change, so significant indeed that they acquire a new meaning."

For example, the term *Rām* has been mostly used by the Sikh Gurus for God in *SGGS* and whenever they use it for Rama, the king of Ayodhya, the distinction is made crystal clear to remove any confusion. However, many Hindu scholars and journalists like Kuldeep Nayyar try to misinterpret this term, without understanding its implications, either out of ignorance

or with a hidden purpose in their mind to denigrate the message of the Sikh Gurus. Blaming the present Akali leadership, Kuldeep Nayyar reports in the Tribune¹⁰: "Efforts have been made to argue that Lord Rama mentioned in *Guru Granth Sahib* is different from the one whom the Hindus worship. The intention is to draw a cleavage between the Hindus and the Sikhs for political ends."

G.S. Talib has resolved this contradiction. According to Talib,¹¹ Sikh Gurus adopted the names like Rama and Krishna derived from Indian mythology for God as these were current among the Indian people and had become synonymous with God in common speech. Thus, Rama, the name of hero-prince in *Ramāyāṇa*, had become the most popular term for God. In *SGGS*, *Rām-Nām* means literally God's name and implies devotion, prayer, meditation. *Rām* is used to designate God by Guru Nanak in *Japuji*¹²:

ਨਾ ਓਹਿ ਮਰਹਿ ਨ ਠਾਗੇ ਜਾਹਿ ॥

ਜਿਨ ਕੈ ਰਾਮੁ ਵਸੈ ਮਨ ਮਾਹਿ ॥

They neither die nor fall into illusion,
In whose soul *Rām* (God) abides.

Concept of God

Some Indian and foreign scholars have misunderstood that the idea of Oneness of God preached by Guru Nanak was the result of the influence of Islamic teachings on him. But this appears to be wrong notion. The idea of Oneness of God¹³ was evolved by Indian seers and philosophers even before the migration of Aryans, but it appears that religious leaders previous to Guru Nanak neglected to preach the spiritual realities to the Indian masses, who remained sunk in superstitions. They continued to worship not only gods and goddesses but animals, serpents, trees, etc. Guru Nanak realized that it was this weakness of Indian society that made them helpless in face of foreign invaders. Guru Nanak differed from Jains, Buddhists and most of the Hindu brand of philosophers by re-defining the Oneness of God by putting the numeral '1' before the open *Oorā* (ੴ) in *mūlmantra* of *SGGS*.

I believe this was a great revolutionary and a scientific innovation of Guru Nanak. The placing of numeral '1' before *Oamkār* (ੴ), pronounced as *Ik-Oamkār*, expressed the unity and Oneness of God eternally. The unity of Godhead was the first article of his faith.

No school of Hindu philosophy believes that God is *Kartā Purkh* in the sense implied by Guru Nanak. The Sankhya school of Hindu philosophy denies His existence and teaches that *Prakriti* creates the universe and *Purusha* has no role to play. The *Nayāya* and *Vaiseska* schools consider God as the efficient cause of the world but not its material cause. A different sequence is proposed by Sankra in his world famous *advaita* system of philosophy. Concept of God as *Nirguṇa-Sarguṇa Brahm* is there, as in *SGGS*, but *Sarguṇa Brahm* is represented by *Īswara*, the totality of all things that are created through the agency of *Māyā*. Guru Nanak rejects the *advaita* school of thought in *Japuji*¹⁴:

ਏਕਾ ਮਾਈ ਜੁਗਤਿ ਵਿਆਈ ਤਿਨਿ ਚੇਲੇ ਪਰਵਾਣੁ ॥

ਇਕੁ ਸੰਸਾਰੀ ਇਕੁ ਤੰਡਾਰੀ ਇਕੁ ਲਾਏ ਦੀਬਾਣੁ ॥

Hail to Thee from whom sprang *Māyā*,
The world and Brahma, Visnu and Siva.

Guru Nanak discarded the worship of the whole pantheon of gods and goddesses of Hindu religion. He gave no importance to principal Vedic gods like Pusan, Indra, Rudra, Visnu and Agni, who were replaced later by the Trinity of Hindu gods: Brahma (the creator), Visnu (the preserver) and Siva (the destroyer). How can they liberate the Indian masses? They are all servants of the Supreme God and are crying to Him for His grace¹⁵:

ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸ਼ੁ ਦੁਆਰੈ ॥ ਉਭੇ ਸੇਵਹਿ ਅਲਖ ਅਪਾਰੈ ॥

ਹੋਰ ਕੋਤੀ ਦਰਿ ਦੀਸੈ ਬਿਲਲਾਦੀ ਮੈ ਗਣਤ ਨ ਆਵੈ ਕਾਈ ਹੇ ॥

Brahma, Visnu and Siva stand at His door,
To serve the unfathomable and infinite Lord.
And many others who are beyond count,
Are seen crying at His door.

Guru Nanak's God is absolute, eternally unchanging Formless One, *Niraṅkār*. He is inscrutable, boundless, self-

existent, ineffable and beyond time. God is the sole creator, the sustainer and the destroyer of the universe. Guru Nanak's God is both transcendent and immanent, pervading the microcosm as well as macrocosm. It is this God who is the object of Guru Nanak's worship.

The idea of divine self-expression¹⁶ is another revolutionary theological thought of Guru Nanak. The concepts of Truth (*sach*), the Name (*nām*), the Word (*sabda*), the Divine Preceptor (*guru*) and the Divine Order (*hukam*) form the key-concepts of divine self-expression. The Truth represents the eternal aspect of God, the Name refers to the object of communication, the Word to the medium of communication, the Divine Preceptor represents the voice of God in man himself and the Divine Order is an all-embracing principle, comprehending the working of the physical as well as the moral world.

All these concepts are inter-linked in the *bānī* of Sikh Gurus and these form the basis of Sikh view point of *Bhakti*. In Sikh religion, *bhakti* is addressed directly to God and not to any *avtar*. In fact, the very idea of incarnation of God is rejected in very strong terms in SGGS¹⁷:

ਮੈ ਮੁਖੁ ਜਲਹੁ ਜਿਤੁ ਕਹਿ ਠਾਕੁ ਜੈਨੀ ॥

Let that mouth be burnt, which says that our Lord (God) is subject to birth.

Creation of the Universe

A detailed discussion on this topic is already given in Chapter 2, "Cosmological Ideas in Science and Religion." However, some elaboration of Hindu view of Cosmology is being made on the basis of a recent paper by RC Verma¹⁸: "Evolution of the Universe and Concepts of Matter: Some Ancient Indian Views."

Rig Veda describes the universe as infinite and made up of Earth, the atmosphere and the sky. It also mentions about the Sun as light-giver of the universe. In observational astronomy, Indian *rishis* studied the phenomena of eclipses and prepared calendars so much needed for their rituals. We find

a plenty of theories of universe in the Indian literature. Pundit Madhusudan Ojha of Jaipur has recognized ten different schools of cosmology in India on the basis of "Nasadya Sukta" of *Rig Veda*, the famous hymn on creation. In Vedic literature, one finds many creation myths relating to Indra, the chief of Vedic gods.

Upanishads put forward diverse theories of creation of the universe. *Chhandogya Upanishad* states: "Brahm desiring to be many, created *taijas*, *ap* and *kshiti*, and entered into these three." Surprisingly, in these theories of creation, no creator is postulated for the purpose of creation. For instance, the creation process in *Brihadarnyak Upanishad* is described as follows: "In the beginning, water (primeval) alone existed, from water was born *Satya* (truth), *Satya* produced *Brahmin* and so on." *Katha Upanishad* gives priority to Fire: "Fire having entered the universe, assumed all forms. Fire was the First to evolve from the primal reality, that from Fire came water, from water the earth."

Vaisesika school of Indian philosophy proposed *parmāṇuvāda* (atomic theory) for creation of the universe: "(i) There is an external universe independent of mind. (ii) This universe exists eternally, it was never created. (iii) Material things must be made up of *parmāṇūs* of various elements, which are the permanent substance. (iv) Once the *mahābhūtas* are produced one after the other, through the divine will (*saṅkalpa*) a big cosmic egg is produced out of the *parmāṇūs* of five elements. (v) Destruction occurs when union of primary *parmāṇūs* is broken. Creation and destruction of universe continues ad infinitum. This process has got neither any beginning nor any end."

There is a lot of confusion and diversification in the ideas about creation of the universe in Vedic, Upanishadic, *Nayaya*, *Visesika*, *Sankhya*, *Yoga*, *Mimansa* and *Vedanta* schools of Indian philosophy. Guru Nanak's ideas about creation of the universe have been summed up in the second chapter of this book. We do find some common ground between these two Indian traditions represented by *SGGS* and *Rig Veda's* "Nasdaya Sukta."

Concept of Transmigration, Salvation, Heaven and Hell

The doctrine of transmigration of the soul or eschatology is common to both the religious traditions. Every religion has tried to explore the basic question: What becomes of human being after death? Sankra, the great Hindu philosopher, compares mankind to a plant. Like plant, it springs up, develops and returns finally to the earth. But as the seed of the plant survives, so also at death the works of a man remain as a seed which sown afresh in the realm of ignorance, gives rise to a new existence in exact correspondence with his character. This is the foundation of famous *karma* theory of transmigration. "What becomes of us after death?" can be answered in three ways: (i) annihilation, (ii) eternal retribution in heaven or hell, and (iii) transmigration. Most of the scientists believe in the first answer. Second answer appeals to the Semitic religious traditions. And for empirical solution of the problem, the third answer satisfies the Indian mind. The doctrine of soul's migration forms the basis of moral law in this world.

The hymns of *Rig Veda* know nothing of migration of the soul. Idea of immortal life exists in many hymns of *Rig Veda*. The idea of heaven and hell is introduced in the *Atharvaveda*. The good are rewarded in heaven and the wicked are punished in the hell. Those who annoy the Brahmins are also condemned to hellish existence¹⁹:

Those who spit at Brahmins,
Or cast on them the mucus of the nose,
They sit there in pools of blood,
Chewing their hair as food.

The concept of salvation or emancipation of soul (*ātmā*) has been a hallmark of Hindu philosophy. A man who is free from desires, his soul (*ātmā*) merges with God (*Brahm*). There is no transmigration for such an emancipated soul. He attains immortality²⁰:

When every passion vanishes
That finds a home in the human heart,
Then he who is mortal becomes immortal,
here already he has attained to *Brahm*.

The soul (*ātma*) of man is assigned four states in the Upanishads: (i) waking, (ii) dream sleep, (iii) deep sleep, i.e., dreamless sleep, in which the soul becomes one with *Brahm* and enjoys unsurpassable bliss, and (iv) the fourth state, usually called *turiyā*, in which union with *Brahm* is continuous and perfect. The aim of the *Yoga* is to attain *turiyā*, a state of the supreme bliss²¹:

The dreamer's knowledge is false,
The sleeper knows nothing at all,
Both go astray, where all this vanishes
There the fourth state is reached.

In Sikh religion, the use of common terms and concepts of Indian origin, borrowed from Vedic, Upanishdic and Yogic systems, has created a lot of confusion in interpreting the message of *SGGS*. For example, Guru Nanak²² has employed *turiyā* term for the state of supreme bliss, but its attainment is through the medium of the Guru or *sādh-saṅgat* and not by *Yoga*:

ਤੁਰੀਆਵਸਥਾ ਸਤਿਗੁਰ ਤੇ ਹਰਿ ਜਾਨੁ ॥

But the fourth state of supreme bliss,
Turiyā, is known only through the True Guru.

ਤੁਰੀਆਵਸਥਾ ਗੁਰਮੁਖਿ ਪਾਈਐ ਸੰਤ ਸਭਾ ਕੀ ਓਟ ਲਗੀ ॥

The *Gurmukh* attains the state of *turiyā*,
Taking to the shelter of the Saint's congregation.

The concepts of transmigration, salvation (*mukti* or *jeevan mukti*), heaven and hell do find a mention in the compositions of Sikh Gurus in *SGGS*. While there is too much stress on performing rituals, sacrifices, pilgrimage, purification, penance and all sorts of *karamkāṇḍ* in Hindu religion to attain salvation or emancipation of the soul, the Sikh Gurus reject *karamkāṇḍ* and advocate service to society, humility and meditation as the means to attain salvation. In Sikh religion, salvation is possible while living in this world and enjoying all pleasures of this worldly life²³:

ਨਾਨਕ ਸਤਿਗੁਰਿ ਭੇਟਿਐ ਪੂਰੀ ਹੋਵੈ ਜੁਗਤਿ ॥

ਹਸੰਦਿਆ ਖੇਲੰਦਿਆ ਪੈਨੰਦਿਆ ਖਾਵੰਦਿਆ ਵਿਚੇ ਹੋਵੈ ਮੁਕਤਿ ॥

O Nanak, meeting the True Guru,
 One comes to know the Perfect way.
 While engaged in activities of life like
 Laughing, playing, dressing and eating,
 One achieves salvation (*mukti*).

Guru Nanak's conception of God's grace repudiates all presumption to salvation by mere human effort. What decides the issue of salvation (*mukti*) is God's grace (*nadar*). It is obvious that the idea of grace is meant to inculcate humility in one's approach to salvation. The salvation is not 'achieved' by man; it is 'bestowed' by God. Salvation is not 'other-worldly' concept in Sikh religion, it has to be attained during this life. The idea of heaven and hell is there in *SGGS* but they do not look as charming or dreadful as in Hindu sacred texts (*Purāṇas*).

Ethics and Morality

There are several religions which preach that God alone exists (*sat*). But if you examine their ethical system, you will find a lurking fear of some force which is other than God. Christianity and Islam have accepted this anti-God element of life, as *Satan* or the devil. A basic dualism has thus crept in those systems. Hinduism propagated the idea of *Ekam Satya*, that God alone is *Sat* (existent) but introduced the idea of *Māyā* philosophically later on. *Māyā* has thus become for the Hindus what evil or devil is for Christians and Muslims; a force anti-God. As a result of *Māyā* concept, the Hindu code of conduct or ethical system is very much based on an avowed dualism. A dichotomy persists in their faith and action. It was left for the Sikh Gurus to remove this dualism from the active life.²⁴

Guru Nanak is the first prophet of God in the history of world religions who removed the dualism and dichotomy between the spiritual life and empirical life of man. In fact, in Sikh religion, the spiritual salvation of man is linked to his social salvation.²⁵ It was Guru Nanak who laid and led the path of universal love and the emancipation of man without distinction of caste and creed. The objective of Guru Nanak's mission of love was to establish equality and fraternity among

all human beings and to resist oppression by safeguarding the human rights and values. In unambiguous terms, he issued forth a call for his mission of love²⁶:

ਜਉ ਤਉ ਪ੍ਰੇਮ ਖੇਲਣ ਕਾ ਚਾਉ ॥
ਸਿਰੁ ਧਰਿ ਤਲੀ ਗਲੀ ਮੇਰੀ ਆਉ ॥

If you want to tread the path of love,
Come forward with your head on your palm.

Sikh Gurus gave to love the importance that they gave to nothing else. It is the direct manifestation of God in us. In fact, the intensity of love in a person shows the level of his spiritual attainment. Guru Gobind Singh epitomized 'Love' as the primary condition for meeting the God²⁷:

ਸਾਚ ਕਹੋਂ ਸੁਨ ਲੇਹੁ ਸਭੈ,
ਜਿਨ ਪ੍ਰੇਮ ਕੀਓ ਤਿਨ ਹੀ ਪ੍ਰਭ ਪਾਇਓ ॥

Listen ye all, I am going to tell the Truth,
Those who love shall meet the Lord (God).

Guru Nanak brought a complete reversal of the socio-religious life and values of his time. Against life-negation and withdrawal from life, he recommended life-affirmation and complete social participation. He accepted a householder's life against monasticism and asceticism. He gave religious sanctity to married life and equality to women. Guru Nanak accepted and practiced social equality and the brotherhood of man against the rigidity of Hindu *varan āshram dharma*. Asceticism and *Ahimsā*, the fundamental doctrines of all Indian religions, were both rejected by Guru Nanak. Hence, a new moral and social order was established in Sikh society.²⁸ According to Grewal²⁹: "The socio-political order of his day had lost legitimacy in the eyes of Guru Nanak, because it had lost its religious roots. By implication, a new social order was needed, based on a new religious dispensation."

The Sikh Gurus have given a new moral code of conduct to their disciples which must awaken the soul in them. The saint in Sikhism should be more human than the ordinary man. The Sikh militarism is a part and parcel of the Sikh creed and the saint should play the role of a soldier, in response to the exigency of the situation.

In Sikh religion, the status of women is equal to men in all respects and there are numerous verses in *SGGS* to glorify the role of women in society. We need not elaborate the status of women in Hindu society. In the caste order of the Brahmins, a woman had been classed with the *Sudras*. For Sankra, woman is the gateway to hell. In the Upanishads, woman and *Sudra* are forbidden to recite Vedic *mantras*³⁰:

If a woman or a *Sudra* learns the Savitri formula,
The Lakshmi formula, the Pranava,
One and all go downwards after death.
Therefore, let these never be communicated to such !
If anyone communicates these to them,
They and the teacher alike go downwards after death.

Hinduism is like a great pyramid of Indian religions and cultures. Despite revolutionary changes introduced by Sikh religion in Indian pyramid, it remains a part and parcel of Indian civilization and culture. Sikh religion must play its destined role in inter-faith dialogues to promote world peace during the new millennium.

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Epilogue

Religion, Science and Mankind*

Science without religion is lame,
Religion without science is blind.

—Albert Einstein

Since ancient times, man has always been fascinated with the mysteries of Nature. He, often, looked in awe at the ever-changing scenario in the sky. The flashes of lightning, the thundering clouds and sudden appearance of floods or earthquakes made him tremble with fear. After a rainfall, the appearance of the rainbow in the sky, made him wonder. These phenomena tingled his curiosity to know the secrets of Nature.

In his attempts to understand the world around him, he thought of the concept of gods and goddesses. In due course of time people started believing that the various natural phenomena were the exhibits of the powers of the gods. For them the bad or good omens were associated with the anger or gladness of one or the other god.

For example, many Indians believe that rainfall occurs only due to the grace of god Indra. Similarly, the flash of lightning is thought to be associated with the death of an unfortunate girl child, as mentioned in Mahabharata – the great Indian epic.

To appease these gods or goddesses the primitive man started practising various rituals and magical ceremonies. He started believing in the existence of supernatural powers, miracles, superstitions and dogmas. With passage of time, these

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thoughts culminated in the concept of the existence of an all-powerful Creator, which was the cause and controller of all these supernatural beings.

During the last 350 years, Science has made a great progress. It has helped us to find the scientific laws behind almost all the natural phenomena. Thus it has exposed the futility of wrong practices and irrational concepts of the ancient religions.

In the sixteenth century, when science initiated the age of logical reasoning, it led to a revolutionary change in the society. In the beginning, science had to face a tough opposition from the religious heads for its attitude of critical and creative inquiry. It had to wage a tough battle against the evils of irrational beliefs and superstitions.

Religious heads opposed the scientific progress tooth and nail. They declared the inventions and discoveries of science as the devil's tools and scientists as anti-religion. Many scientists were imprisoned and some had to lay down their lives for the cause of science. The names of Galileo Galilei and Giordano Bruno need a special mention in this case. Thus science and religion had a head-on collision with each other. With the passage of time it became prevalent that science and religion are irreconcilable.

Misconceptions

During ancient times, Christians believed that the Earth was at the centre of Universe and Sun, Moon and the stars revolved around it. They believed that this special position has been granted to the earth because the man – a special creation of God, is born on it.

With the development of Science, many scientists especially Copernicus, Galileo, Tycho Brahe and Kepler peeped into the depths of space. Their astronomical investigations had pointed out that our earth is neither at the centre of the Universe nor at the centre of the Milky Way (our galaxy). It is not even at the centre of the solar system. They also found out that neither the Sun nor any other star is revolving around our earth. They declared that in the immensity of the stars, planets and

satellites of Universe, our earth is a small-sized planet, which revolves around a medium sized star—the Sun.

These facts of science were in contradiction with the ideas enshrined in *Bible*—the Holy Book of the Christians. The Pope, the Church and several religious organisations of Europe opposed these ideas tooth and nail. As a result Copernicus was unable to publish the results of his research until his death. Galileo was charged with blasphemy and was imprisoned. Ultimately, almost blind and suffering from serious illness in his old age he had to seek pardon from the Church for his faith in the scientific truths. Only then he was released from the prison.

With the development and progress in research activities, the validity of the scientific truths got established. Then the scientists found a renewed courage to assert themselves and declare their findings much more confidently. The discovery of Relativity theory and Quantum mechanics in the twentieth century caused revolutionary changes in our ideas about macrocosm and microcosm. New ideas about the cause, effect, existence, and orientation emerged in the scientific world. These ideas not only changed the established concepts but also caused a lot of changes in our perception of the ultimate reality.

Transition

In due course of time, man became aware that science is essential for the material progress of humanity, whereas religion is essential for the evolution of human spirit. Thus the role and significance of both of these fields has to be properly understood and appreciated.

All religions have the common object of explaining to man his real identity as different from the physical reality. Religion aims at giving to man a code of conduct and behaviour so that man does not commit such acts as cause sufferings to him and others and also make him suffer divine retribution.¹

It is true that religion believes in the existence of a supernatural power or a Creator, who is thought of as the cause of all natural phenomena and mysteries of Nature. By having faith in the existence of all-powerful Creator, religion encourages

its worship through prayer and rituals. Religion tries to understand and unravel the mysteries of life but in its own way. It believes in mystical experience.

Religion explains man's relationship with other beings and with God. It gives meaning to life and existence and inspires for a noble goal and throws light on how that goal can be achieved. For this purpose, it gives its own world-view to man and prescribes certain practices in order that he may be able to realize the self and have link with God and could attain peace of mind.

Science has an entirely different approach to understand the nature of reality in the physical realm. All scientific explorations aim at discovering certain secrets behind the forces and phenomena of Nature and understanding the laws underlying them.

Science relies on the spirit of critical and creative inquiry. Based on analytical techniques it talks about the various forms of energy and its inter-convertibility from one form to another. Scientific approach to the problems of life depends on verifiable facts and rationality.² Science attempts to make the religion free from the maladies of fundamentalism, nepotism, dogmas, irrational beliefs and superstitions.

The dawn of space age and the vigorous research activities being undertaken in the present era have challenged the validity of various concepts prevalent in different religions. For example, in Hindu mythology, the black spots visible on the Moon's surface are thought to be the effect of a curse of Rishi Gautama.

In the second half of the twentieth century, man has landed on moon using his newly discovered spacecrafts. He has been able to determine the cause of these black spots as the after effects of volcanic activity, which occurred on Moon during its ancient past. In this way, science has been able to dispel the darkness of mythology.

Taking note of latest scientific discoveries, various religious heads have tried to replace the prevalent misconceptions of their religions, with the concepts and ideas, in tune with modern scientific facts. Thus science has helped the religions

to clean the cobwebs of earlier fanciful and irrational beliefs.

Though science has been instrumental in providing us with a large number of comforts of our daily life yet it has also given birth to atom bombs, nuclear weapons, missiles and poisonous gases. The mere presence of these deadly objects is a great threat to the very existence of humanity. Religion, with its concept of Fatherhood of God and Universal brotherhood of man, has the ability to produce in us a feeling of responsibility towards the right usage of scientific gains.

Awakening

The interaction between science and religion has been quite interesting. It has led to a new awakening, causing a perceptible change in their inter-relationship. With passage of time, accepting the scientific truths, religious organisations undertook the process of replacement of the irrational beliefs with truth and rationality.

For example, in the 'Bible' it is mentioned that the Creation took place in six days only. But this idea is in contradiction with the established scientific truths. Similarly, the Holy *Quran* of the Muslims mentions about the existence of seven upper and seven nether worlds. Even this idea could not hold the ground against the truth of modern scientific findings.

In contrast to these religions, Sikhism is relatively a new religion. The ideas as expressed in its holy Granth – *Sri Guru Granth Sahib* (SGGS) have been found to be more in tune with the modern scientific facts³. For example, in the case of the mystery of Creation, unlike other Holy Scriptures, SGGS makes no pretence to unfold it. Though various notions regarding Creation had been current at the time of the compilation of the Holy Granth, yet the Sikh Gurus felt that these had been fanciful and had little rational basis. They, therefore, categorically rejected the traditional Indian and Semitic beliefs as to time, size, sequence and sustenance of the Universe.

But, the poetic compositions of SGGS, which are rich in cosmological formulations, present the intuitive insights into reality and its modes. SGGS tells us that for anyone to try to

fix the date, time, season and circumstance of Creation would be something utterly presumptuous. Guru Nanak, the first Sikh Guru, in his composition 'Japuji' says:

ਕਵਣੁ ਸੁ ਵੇਲਾ ਵਖਤੁ ਕਵਣੁ ਕਵਣੁ ਬਿਤਿ ਕਵਣੁ ਵਾਰੁ ॥

ਕਵਣਿ ਸਿ ਰੁਤੀ ਮਾਹੁ ਕਵਣੁ ਜਿਤੁ ਹੋਆ ਆਕਾਰੁ ॥

ਵੇਲ ਨ ਪਾਈਆ ਪੰਡਤੀ ਜਿ ਹੋਵੈ ਲੇਖੁ ਪੁਰਾਣੁ ॥

ਵਖਤੁ ਨ ਪਾਇਓ ਕਾਦੀਆ ਜਿ ਲਿਖਨਿ ਲੇਖੁ ਕੁਰਾਣੁ ॥

ਬਿਤਿ ਵਾਰੁ ਨਾ ਜੋਗੀ ਜਾਣੈ ਰੁਤਿ ਮਾਹੁ ਨਾ ਕੋਈ ॥

ਜਾ ਕਰਤਾ ਸਿਰਠੀ ਕਉ ਸਾਜੇ ਆਪੇ ਜਾਣੈ ਸੋਈ ॥ (Japuji, p. 4)

What was the time and moment? Which was the week's day?

Which was the month or season, when Universe took shape?

Had pundits known this moment, must have written in Puranas.

Had qazis known the time, would have given in Quran.

No yogi knows the time, weekday of the Creation;

Creator alone is the knower, being Master of all beings.

This hymn of Guru Nanak is in tune with the latest scientific findings, as even our modern scientists, with the latest scientific devices at their disposal, have not been successful as yet to predict the date, time, season and circumstances of the Creation.

Modern researchers have also failed to gauge the true extent of the Universe till date. Every other day we listen about new discoveries being made, making the extent of knowable Universe larger and larger. In *Japuji*, Guru Nanak talks about the existence of millions of worlds:

ਪਾਤਾਲਾ ਪਾਤਾਲ ਲਖ ਆਗਾਸਾ ਆਗਾਸ ॥

ਓੜਕ ਓੜਕ ਭਾਲਿ ਥਕੇ ਵੇਦ ਕਹਨਿ ਇਕ ਵਾਤ ॥

ਸਹਸ ਅਠਾਰਹ ਕਹਨਿ ਕਤੇਬਾ ਅਸੁਲੂ ਇਥੁ ਧਾਤੁ ॥

ਲੇਖਾ ਹੋਇ ਤ ਲਿਖੀਐ ਲੇਖੇ ਹੋਇ ਵਿਣਾਸੁ ॥ (Japuji, p. 5)

Netherlands below netherlands, and skies above the skies,
They are in teeming millions, Vedas no limit assign.

Semitic books speak of eighteen thousand, with root the
Eternal Being;

Were they to attempt a list, would die in the attempt.

Similarly, many more hymns of *SGGS* can be cited, which describe the various aspects of the physical world, and are in accord with the present state of knowledge. It is pertinent to mention that the hymns of *SGGS* are also in tune with the recent discoveries of vastness of creation, evolution of species and in dispelling the myths concerning the earth, although these have been written about 550 years ago.

Coherence

Science has made great progress during the last 350 years. The development of science is still continuing. Despite this, the fact has emerged very strongly that for the attainment of everlasting peace and prosperity for the mankind, the coherence of science and religion is a must. Thus, their integration rather than their opposition to each other is talk of the day.

As we are aware that science and religion represent two great systems of human thought. Both of these seek objective perceptions in their attempts to comprehend existence and reality.⁴ The fundamental distinction lies in the direction in which they look in pursuit of their aims. But in both cases a subtle interplay between theory and observation is involved. Both approaches are intellectual as well as empirical; in one case the confirmation of an idea is sought in external experiment, while in the other this confirmation is sought in internal experience. In both cases we get metaphors of truth: either as scientific theories and explanations or as religious symbols and scriptures.

Despite being autonomous undertakings, religion and science are like complimentary forces that operate in tandem. For the material and spiritual progress of the mankind the coherence of these two forces is an urgent need of modern times. Several religious scholars as well as many eminent scientists have time and again stressed about this need. A few quotes in this case should suffice.

Abdu'l Baha, a renowned religious scholar, has opined⁵⁻⁶: "Religion and Science are the two wings upon which man's intelligence can soar into the heights, with which the human soul can progress. It is not possible to fly with one wing alone.

Should a man try to fly with the wings of religion alone he would quickly fall into the quagmire of superstition, whilst on the other hand, with the wings of science alone he would also make no progress, but fall into the despairing slough of materialism."

In fact, as is the opinion of many scientists, religiousness is an indispensable condition for anyone who wishes to do science. This point has been stressed upon by many scientists as being indicative of the psychological connection between religion and science. The renowned scientist T.H. Huxley had once opined⁷: "Nothing great in science has ever been done by men, whatever their powers, in whom the Divine afflatus of the truth-seeker was wanting."

In religion and science, man has two of the greatest forces, which influence him: one is the force of his intuition and the other is that of his impulse to accurate observation and deduction. Some of the greatest scientists have succeeded in synthesizing the two forces inwardly, on a personal level. As Charles Townes, a renowned scientist and Nobel laureate has opined⁸: "To me science and religion are both universal, and basically similar. In fact, to make the argument clear, I should like to adopt the rather extreme point of view that their differences are largely superficial, and that the two become almost indistinguishable when we look at the real nature of each."

Swami Vivekananda, a renowned religious scholar had declared⁹: "I do not mean that those who want to search after truth through external nature are wrong, or that those who want to search after truth through internal nature are higher. These two are the two modes of procedure. Both of them must live; both of them must be studied; and in the end we shall find that they meet." Similarly, Fred Hoyle, the famous astronomer, while delivering an address to a meeting of the American Physical Society had said¹⁰: "Why in fact do we do science? ... The real motive, of course is a religious one... our aim is the same (as that of religion): to understand the world and ourselves..."

Thus despite the subtle differences in the methods of Religion and Science, the essence of both is the same, because

truth is one. Even their objective to comprehend existence and reality is the same. In the light of the above discussion it is worthwhile to conclude that the coherence of both these systems is a *sine qua non* factor for attainment of everlasting peace, prosperity and spiritual enlightenment of Mankind.

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Appendix I

Hymn on Sūnn (SGGS, pp.1037-38)

ਮਾਰੂ ਮਹਲਾ ੧ ॥

ਸੁੰਨ ਕਲਾ ਅਪਰੰਪਰਿ ਧਾਰੀ ॥ ਆਪਿ ਨਿਰਾਲਮੁ ਅਪਰ ਅਪਾਰੀ ॥
 ਆਪੇ ਕੁਦਰਤਿ ਕਰਿ ਕਰਿ ਦੇਖੈ ਸੁੰਨਹੁ ਸੁੰਨ ਉਪਾਇਦਾ ॥੧॥
 ਪਉਣੁ ਪਾਣੀ ਸੁੰਨੈ ਤੇ ਸਾਜੇ ॥ ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕਾਇਆ ਗੜ ਰਾਜੇ ॥
 ਅਗਨਿ ਪਾਣੀ ਜੀਉ ਜੋਤਿ ਤੁਮਾਰੇ ਸੁੰਨੇ ਕਲਾ ਰਹਾਇਦਾ ॥੨॥
 ਸੁੰਨਹੁ ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਉਪਾਏ ॥ ਸੁੰਨੇ ਵਰਤੇ ਜੁਗ ਸਥਾਏ ॥
 ਇਸੁ ਪਦ ਵੀਚਾਰੇ ਸੋ ਜਨੁ ਪੂਰਾ ਤਿਸੁ ਮਿਲੀਐ ਭਰਮੁ ਚੁਕਾਇਦਾ ॥੩॥
 ਸੁੰਨਹੁ ਸਪਤ ਸਰੋਵਰ ਥਾਪੇ ॥ ਜਿਨਿ ਸਾਜੇ ਵੀਚਾਰੇ ਆਪੇ ॥
 ਤਿਤੁ ਸਤ ਸਰਿ ਮਨੂਆ ਗੁਰਮੁਖਿ ਨਾਵੈ ਫਿਰਿ ਬਾਹੁੜਿ ਜੋਨਿ ਨ ਪਾਇਦਾ ॥੪॥
 ਸੁੰਨਹੁ ਚੰਦੁ ਸੂਰਜੁ ਗੈਣਾਰੇ ॥ ਤਿਸ ਕੀ ਜੋਤਿ ਤ੍ਰਿਭਵਣ ਸਾਰੇ ॥
 ਸੁੰਨੇ ਅਲਖ ਅਪਾਰ ਨਿਰਾਲਮੁ ਸੁੰਨੇ ਤਾੜੀ ਲਾਇਦਾ ॥੫॥
 ਸੁੰਨਹੁ ਧਰਤਿ ਅਕਾਸੁ ਉਪਾਏ ॥ ਬਿਨੁ ਬੰਮਾ ਰਾਖੇ ਸਚੁ ਕਲ ਪਾਏ ॥
 ਤ੍ਰਿਭਵਣ ਸਾਜਿ ਮੇਖਲੀ ਮਾਇਆ ਆਪਿ ਉਪਾਇ ਖਪਾਇਦਾ ॥੬॥
 ਸੁੰਨਹੁ ਖਾਣੀ ਸੁੰਨਹੁ ਬਾਣੀ ॥ ਸੁੰਨਹੁ ਉਪਜੀ ਸੁੰਨਿ ਸਮਾਣੀ ॥
 ਉਤਭੁਜੁ ਚਲਤੁ ਕੀਆ ਸਿਰਿ ਕਰਤੈ ਬਿਸਮਾਦੁ ਸਬਦਿ ਦੇਖਾਇਦਾ ॥੭॥
 ਸੁੰਨਹੁ ਰਾਤਿ ਦਿਨਸੁ ਦੁਇ ਕੀਏ ॥ ਓਪਤਿ ਖਪਤਿ ਸੁਖਾ ਦੁਖ ਦੀਏ ॥
 ਸੁਖ ਦੁਖ ਹੀ ਤੇ ਅਮਰੁ ਅਤੀਤਾ ਗੁਰਮੁਖਿ ਨਿਜ ਘਰੁ ਪਾਇਦਾ ॥੮॥
 ਸਾਮ ਵੇਦੁ ਰਿਗੁ ਜੁਜਰੁ ਅਬਰਬਣੁ ॥ ਬ੍ਰਹਮੇ ਮੁਖਿ ਮਾਇਆ ਹੈ ਤ੍ਰੈ ਗੁਣ ॥
 ਤਾ ਕੀ ਕੀਮਤਿ ਕਹਿ ਨ ਸਕੈ ਕੋ ਤਿਉ ਬੋਲੇ ਜਿਉ ਬੋਲਾਇਦਾ ॥੯॥
 ਸੁੰਨਹੁ ਸਪਤ ਪਾਤਾਲ ਉਪਾਏ ॥ ਸੁੰਨਹੁ ਭਵਣ ਰਖੇ ਲਿਵ ਲਾਏ ॥
 ਆਪੇ ਕਾਰਣੁ ਕੀਆ ਅਪਰੰਪਰਿ ਸਭੁ ਤੋਰੇ ਕੀਆ ਕਮਾਇਦਾ ॥੧੦॥
 ਰਜ ਤਮ ਸਤ ਕਲ ਤੇਰੀ ਛਾਇਆ ॥ ਜਨਮ ਮਰਣ ਹਉਮੈ ਦੁਖੁ ਪਾਇਆ ॥
 ਜਿਸ ਨੋ ਕ੍ਰਿਪਾ ਕਰੇ ਹਰਿ ਗੁਰਮੁਖਿ ਗੁਣਿ ਚਉਥੈ ਮੁਕਤਿ ਕਰਾਇਦਾ ॥੧੧॥
 ਸੁੰਨਹੁ ਉਪਜੇ ਦਸ ਅਵਤਾਰਾ ॥ ਸ੍ਰਿਸਟਿ ਉਪਾਇ ਕੀਆ ਪਾਸਾਰਾ ॥
 ਦੇਵ ਦਾਨਵ ਗਣ ਗੰਧਰਬ ਸਾਜੇ ਸਭਿ ਲਿਖਿਆ ਕਰਮ ਕਮਾਇਦਾ ॥੧੨॥
 ਗੁਰਮੁਖਿ ਸਮਝੈ ਰੋਗੁ ਨ ਹੋਈ ॥ ਇਹ ਗੁਰ ਕੀ ਪਉੜੀ ਜਾਣੈ ਜਨੁ ਕੋਈ ॥
 ਜੁਗਰ ਜੁਗੰਤਰਿ ਮੁਕਤਿ ਪਰਾਇਣ ਸੋ ਮੁਕਤਿ ਭਇਆ ਪਤਿ ਪਾਇਦਾ ॥੧੩॥
 ਪੰਚ ਤਤੁ ਸੁੰਨਹੁ ਪਰਗਾਸਾ ॥ ਦੇਹ ਸੰਜੋਗੀ ਕਰਮ ਅਭਿਆਸਾ ॥
 ਬੁਰਾ ਭਲਾ ਦੁਇ ਮਸਤਕਿ ਲੀਖੇ ਪਾਪੁ ਪੁੰਨੁ ਬੀਜਾਇਦਾ ॥੧੪॥
 ਉਤਮ ਸਤਿਗੁਰ ਪੁਰਖ ਨਿਰਾਲੇ ॥ ਸਬਦਿ ਰਤੇ ਹਰਿ ਰਸਿ ਮਤਵਾਲੇ ॥
 ਰਿਧਿ ਬੁਧਿ ਸਿਧਿ ਗਿਆਨੁ ਗੁਰੂ ਤੇ ਪਾਈਐ ਪੂਰੈ ਭਾਗਿ ਮਿਲਾਇਦਾ ॥੧੫॥
 ਇਸੁ ਮਨ ਮਾਇਆ ਕਉ ਨੇਹੁ ਘਨੇਰਾ ॥ ਕੋਈ ਬੂਝਤੁ ਗਿਆਨੀ ਕਰਹੁ ਨਿਬੇਰਾ ॥
 ਆਸਾ ਮਨਸਾ ਹਉਮੈ ਸਹਸਾ ਨਰੁ ਲੋਭੀ ਕੂੜੁ ਕਮਾਇਦਾ ॥੧੬॥
 ਸਤਿਗੁਰ ਤੇ ਪਾਏ ਵੀਚਾਰਾ ॥ ਸੁੰਨ ਸਮਾਧਿ ਸਚੇ ਘਰ ਬਾਰਾ ॥
 ਨਾਨਕ ਨਿਰਮਲ ਨਾਦੁ ਸਬਦ ਧੁਨਿ ਸਚੁ ਰਾਮੇ ਨਾਮਿ ਸਮਾਇਦਾ ॥੧੭॥੫॥੧੭॥

Appendix II

Hymn on Sikh Cosmology (SGGS, pp.1035-36)

ਮਾਝੁ ਮਹਲਾ ੧ ॥

ਅਰਬਦ ਨਰਬਦ ਪੁੰਧੁਕਾਰਾ ॥ ਧਰਣਿ ਨ ਗਗਨਾ ਹੁਕਮੁ ਅਪਾਰਾ ॥
 ਨਾ ਦਿਨੁ ਰੈਨਿ ਨ ਚੰਦੁ ਨ ਸੂਰਜੁ ਸੁੰਨ ਸਮਾਧਿ ਲਗਾਇਦਾ ॥੧॥
 ਖਾਣੀ ਨ ਬਾਣੀ ਪਉਣ ਨ ਪਾਣੀ ॥ ਓਪਤਿ ਖਪਤਿ ਨ ਆਵਣ ਜਾਣੀ ॥
 ਖੰਡ ਪਤਾਲ ਸਪਤ ਨਹੀ ਸਾਗਰ ਨਦੀ ਨ ਨੀਰੁ ਵਹਾਇਦਾ ॥੨॥
 ਨਾ ਤਦਿ ਸੁਰਗੁ ਮਛੁ ਪਇਆਲਾ ॥ ਦੋਜਕੁ ਭਿਸਤੁ ਨਹੀ ਧੈ ਕਾਲਾ ॥
 ਨਰਕੁ ਸੁਰਗੁ ਨਹੀ ਜੰਮਣੁ ਮਰਣਾ ਨਾ ਕੋ ਆਇ ਨ ਜਾਇਦਾ ॥੩॥
 ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਨ ਕੋਈ ॥ ਅਵਰੁ ਨ ਦੀਸੈ ਏਕੋ ਸੋਈ ॥
 ਨਾਰਿ ਪੁਰਖੁ ਨਹੀ ਜਾਤਿ ਨ ਜਨਮਾ ਨਾ ਕੋ ਦੁਖੁ ਸੁਖੁ ਪਾਇਦਾ ॥੪॥
 ਨਾ ਤਦਿ ਜਤੀ ਸਤੀ ਬਨਵਾਸੀ ॥ ਨਾ ਤਦਿ ਸਿਧ ਸਾਧਿਕ ਸੁਖਵਾਸੀ ॥
 ਜੋਗੀ ਜੰਗਮ ਭੇਖੁ ਨ ਕੋਈ ਨਾ ਕੋ ਨਾਥੁ ਕਹਾਇਦਾ ॥੫॥
 ਜਪ ਤਪ ਸੰਜਮ ਨਾ ਬੁਤ ਪੂਜਾ ॥ ਨਾ ਕੋ ਆਖਿ ਵਖਾਣੈ ਦੂਜਾ ॥
 ਆਪੇ ਆਪਿ ਉਪਾਇ ਵਿਗਸੈ ਆਪੇ ਕੀਮਤਿ ਪਾਇਦਾ ॥੬॥
 ਨਾ ਸੁਚਿ ਸੰਜਮੁ ਤੁਲਸੀ ਮਾਲਾ ॥ ਗੋਪੀ ਕਾਨੁ ਨ ਗਉ ਗੁੰਆਲਾ ॥
 ਤੰਤੁ ਮੰਤੁ ਪਾਖੰਡੁ ਨ ਕੋਈ ਨਾ ਕੋ ਵੰਸੁ ਵਜਾਇਦਾ ॥੭॥
 ਕਰਮ ਧਰਮ ਨਹੀ ਮਾਇਆ ਮਾਖੀ ॥ ਜਾਤਿ ਜਨਮੁ ਨਹੀ ਦੀਸੈ ਆਖੀ ॥
 ਮਮਤਾ ਜਾਲੁ ਕਾਲੁ ਨਹੀ ਮਾਥੈ ਨਾ ਕੋ ਕਿਸੈ ਧਿਆਇਦਾ ॥੮॥
 ਨਿੰਦੁ ਬਿੰਦੁ ਨਹੀ ਜੀਉ ਨ ਜਿੰਦੋ ॥ ਨਾ ਤਦਿ ਗੋਰਖੁ ਨਾ ਮਾਛਿੰਦੋ ॥
 ਨਾ ਤਦਿ ਗਿਆਨੁ ਧਿਆਨੁ ਕੁਲ ਓਪਤਿ ਨਾ ਕੋ ਗਣਤ ਗਣਾਇਦਾ ॥੯॥
 ਵਰਨ ਭੇਖ ਨਹੀ ਬ੍ਰਹਮਣ ਖੜੀ ॥ ਦੇਉ ਨ ਦੇਹੁਰਾ ਗਉ ਗਾਇਤ੍ਰੀ ॥
 ਹੋਮ ਜਗ ਨਹੀ ਤੀਰਥਿ ਨਾਵਣੁ ਨਾ ਕੋ ਪੂਜਾ ਲਾਇਦਾ ॥੧੦॥
 ਨਾ ਕੋ ਮੁਲਾ ਨਾ ਕੋ ਕਾਜੀ ॥ ਨਾ ਕੋ ਸੇਖੁ ਮਸਾਇਕੁ ਹਾਜੀ ॥
 ਰਈਅਤਿ ਰਾਉ ਨ ਹਉਮੈ ਦੁਨੀਆ ਨਾ ਕੋ ਕਹਣੁ ਕਹਾਇਦਾ ॥੧੧॥
 ਭਾਉ ਨ ਭਗਤੀ ਨਾ ਸਿਵ ਸਕਤੀ ॥ ਸਾਜਨੁ ਮੀਤੁ ਬਿੰਦੁ ਨਹੀ ਰਕਤੀ ॥
 ਆਪੇ ਸਾਹੁ ਆਪੇ ਵਣਜਾਰਾ ਸਾਚੇ ਏਹੋ ਭਾਇਦਾ ॥੧੨॥
 ਬੇਦ ਕਤੇਬ ਨ ਸਿੰਮ੍ਰਿਤਿ ਸਾਸਤ ॥ ਪਾਠ ਪੁਰਾਣ ਉਦੈ ਨਹੀ ਆਸਤ ॥
 ਕਹਤਾ ਬਕਤਾ ਆਪਿ ਅਗੋਚਰੁ ਆਪੇ ਅਲਖੁ ਲਖਾਇਦਾ ॥੧੩॥
 ਜਾ ਤਿਸੁ ਭਾਣਾ ਤਾ ਜਗਤੁ ਉਪਾਇਆ ॥ ਬਾਝੁ ਕਲਾ ਆਡਾਣੁ ਰਹਾਇਆ ॥
 ਬ੍ਰਹਮਾ ਬਿਸਨੁ ਮਹੇਸੁ ਉਪਾਏ ਮਾਇਆ ਮੋਹੁ ਵਧਾਇਦਾ ॥੧੪॥
 ਵਿਰਲੇ ਕਉ ਗੁਰਿ ਸਬਦੁ ਸੁਣਾਇਆ ॥ ਕਰਿ ਕਰਿ ਦੇਖੈ ਹੁਕਮੁ ਸਬਾਇਆ ॥
 ਖੰਡ ਬ੍ਰਹਮੰਡ ਪਾਤਾਲ ਅਰੰਭੇ ਗੁਪਤਹੁ ਪਰਗਟੀ ਆਇਦਾ ॥੧੫॥
 ਤਾ ਕਾ ਅੰਤੁ ਨ ਜਾਣੈ ਕੋਈ ॥ ਪੂਰੇ ਗੁਰ ਤੇ ਸੋਝੀ ਹੋਈ ॥
 ਨਾਨਕ ਸਾਚਿ ਰਤੇ ਬਿਸਮਾਦੀ ਬਿਸਮ ਭਏ ਗੁਣ ਗਾਇਦਾ ॥੧੬॥੩॥੧੫॥